



# GEOGRAPHY OF COMMERCE AND INDUSTRY

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ROCHELEAU





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# THE GEOGRAPHY OF COMMERCE AND INDUSTRY

BY  
W. F. ROCHELEAU  
Author of "Great American Industries"

Formerly State Institute Conductor for Minnesota, later Department of Psychology and  
Pedagogy, and Superintendent of Training School, Southern  
Illinois State Normal University

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## PREFACE

Of the multitude of pupils in our public schools, only a few reach the eighth grade, and even a smaller number enter the high school, yet those who terminate their school career thus early become bread winners and home makers, and constitute a large proportion of our citizens. Many of these young people leave school almost totally ignorant of sources of supply, processes of manufacture, and cost of our most common commodities. That a knowledge of the world's great industries would give them additional power in solving the problems of life, and also make them more useful citizens, is the belief of the author of this work.

The Geography of Commerce and Industry has been prepared to meet the needs of the junior high school and pupils of the eighth grade. It recognizes the dearth of reference works on many of the subjects treated, and has given the leading industries such treatment as to make each chapter a unit.

The dependence of industries upon geographical conditions, the relation of man to his environment, and the effect of commerce upon civilization are clearly shown. The industrial life of our own country is fully treated, and then the relation of the United States to other countries, and of these to each other, are shown.

The illustrations are chosen for the purpose of adding information and interest, and each map is made for the express purpose of emphasizing the feature that it represents. The relief maps were modelled by Mr. Georg Thorne-Thomsen of the School of Education, University of Chicago, especially for this work.

Many of the questions are designed to awaken thought and lead to further study, and cannot be answered directly. By assigning them to different pupils, so that each will have one or more to investigate and report upon, they can be made to add much to the interest of the work.

The less important countries are so grouped in chapters that, if desired, their study can be omitted without breaking the continuity of thought.

The author is under special obligation to Mr. Oscar Brilliant, for many years a resident of Budapest, for the chapter on the countries of Southern Europe. Mr. Brilliant's familiarity with this region makes his contribution one of unusual value.

W. F. R.

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## INTRODUCTION

### CONDITIONS THAT DETERMINE INDUSTRIES

About one-half of the people living on the earth occupy less than one-seventh of its surface. The chief causes of this unequal distribution of mankind are: climate, conditions of soil, adaptation of plants to soil and climate, man's ability to transport himself and the commodities he needs from one locality to another, and his capacity to engage in commerce and manufacturing.

**Climate** Temperature and moisture are the most important conditions of climate. In general, the earth is divided according to climate into the tropical, the temperate and the polar regions. The tropical regions are characterized by a high temperature, heavy rainfall in some localities and vast arid regions in others. In the polar regions we find long, cold winters and short, hot summers. Where these regions are coldest, there are no forests, and the scanty vegetation consists of mosses and lichens with a few flowering plants that mature during the short summer. The reindeer, the polar bear, the walrus and some species of seal are the only animals that are valuable to the inhabitants.

Well defined temperature seasons mark the temperate regions which are free from the extreme heat of the tropics and the blighting cold of the frigid zones. During spring and summer, plants grow and mature; during autumn and winter vegetation rests. It is necessary for the inhabitants of the temperate regions to produce and gather in summer most of the material they need for the winter. The people must be industrious and saving, always with a plan for the future. Within these regions are found the most valuable grains, fruits and other food products such as wheat, corn, the potato, the apple, the peach, the plum and many small fruits. The temperate regions are







likewise the home of the most valuable domestic animals—horses, cattle, sheep and swine.

The inhabitants of the temperate regions have at their disposal a great variety of resources. They live in a climate that stimulates



ELEPHANTS USED FOR PACK ANIMALS, CEYLON

them to activity and amidst conditions that provide opportunities for a great variety of occupations. The temperate regions are best adapted to man's development, and it is in these regions, especially in the north



temperate zone, that the greatest nations have had their home and that civilization has made its most rapid progress.

**Soil and Vegetation** While man can live a long distance from his source of supplies, because of the means of transportation he has perfected, it is much more convenient for him to have his sources of food, clothing and building material near at hand. Therefore, the great centers of population are and always have been in those regions where soil and rainfall produce an abundant harvest, such as valleys of the Ganges and the Nile, and the great prairie regions of North America.

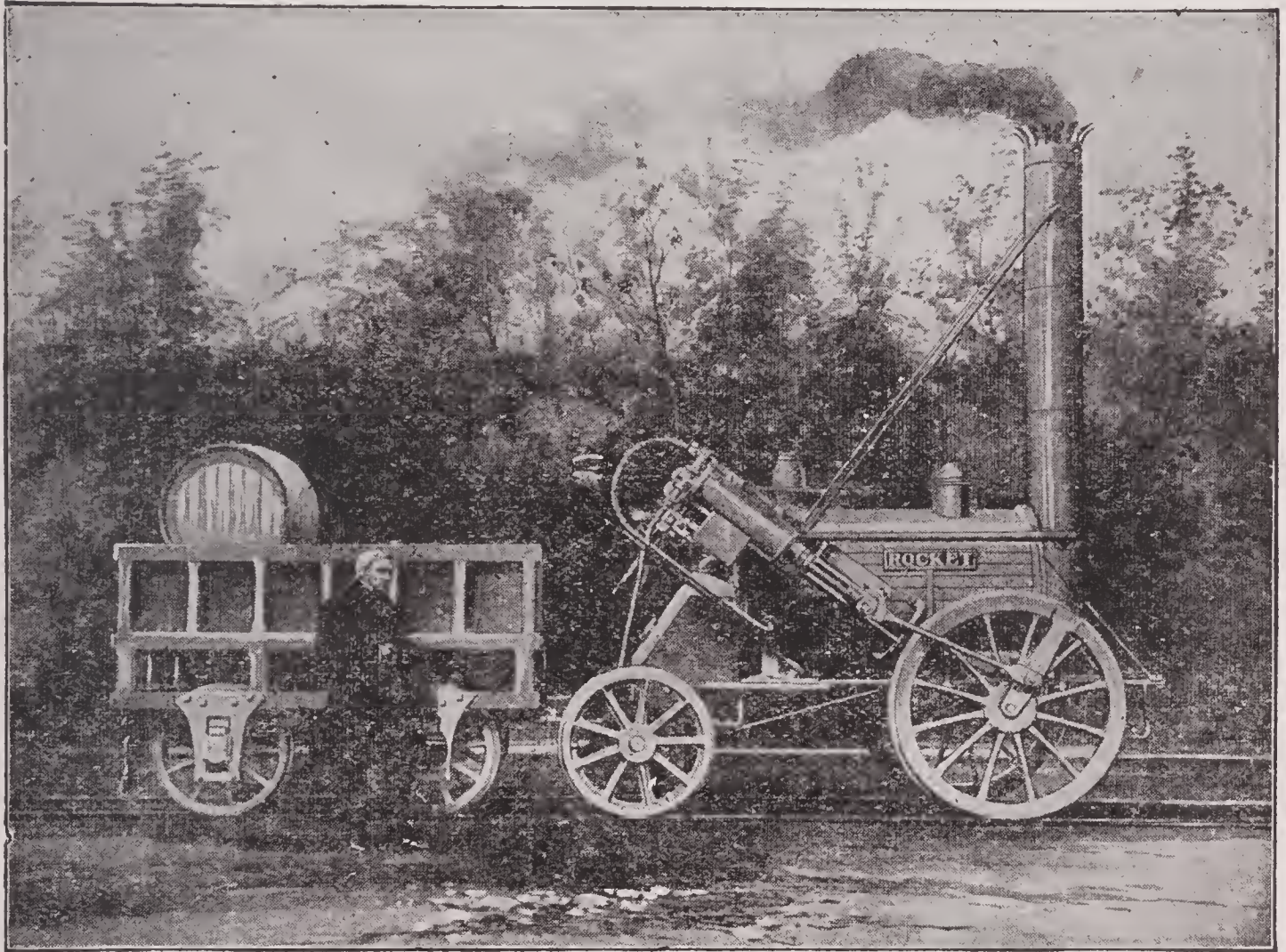
The plants cultivated to supply man's needs have a wide range of climatic conditions. Cotton, for instance, requires a hot climate, while wheat and rye require a cool temperate climate and the range of wheat is from a medium to a cool temperate climate. Rice will succeed only where the land can be flooded, while corn thrives best in a dry soil where the annual rainfall is from thirty to forty inches. These conditions make agriculture profitable over extensive areas and in nearly all the agricultural regions we find a thriving population.

**Industries and Commerce** It is only the savage who tries to supply all his needs by himself. The further advanced a people are in civilization, the greater their number of wants, and the more difficult it becomes for each one to supply all his needs. Moreover, while numerous industries are carried on in almost every community, some localities are better adapted than others to a special line of industry. The rapid mountain streams of New England furnish abundant water power while the soil makes agriculture difficult, consequently, the New England States early became the leading manufacturing center of the country. Because of their deep fertile soil and salubrious climate, the prairies of the Mississippi valley have become the most valuable agricultural region of the world.

It is to the advantage of the inhabitants of each region to engage in those industries to which the region is best adapted. The great



agricultural regions produce an abundance of food, a portion of which is exchanged with the manufacturing regions for clothing and other manufactured products needed on the farms. Again, one person has an aptitude for farming and another for making and operating machinery, and so on; it is to the advantage of each individual to follow the



THE "ROCKET," THE FIRST SUCCESSFUL LOCOMOTIVE  
From the photograph of a model in the Field Columbian Museum, Chicago

occupation for which he has a special aptitude and exchange the products of his labor for the products of the labor of others.

Trade began by the exchange of single articles between individuals, such as a bushel of wheat for a pair of shoes. It was soon discovered that such exchanges were profitable for communities as well as individuals and trade was extended. This expansion has continued until



all nations are now engaged to a greater or less extent in the exchange of commodities.

**Transportation** Exchange of commodities created a demand for means of transporting them. At first man was his own beast of burden and carried upon his head or back whatever commodities he wished to exchange. Later he used boats whenever he had access to bodies of water. Then he domesticated animals and trained them to carry his burdens. From these simple beginnings the great systems of transportation, including ships, roads, railways and airships have been developed.

Many of the products of the most highly civilized nations are now found in nearly all regions inhabited by man.

### QUESTIONS

Why are not camels and elephants used as beasts of burden in the United States?

What sort of wagon roads are found in your country? Can you tell how these roads might be improved?

How is money for building and repairing roads obtained?

Which would you prefer: a trip by rail or one by boat? Why?

Why can electric railways be constructed where steam railways cannot?

Of what advantage is the electric railway to those who live in the country?

Why are locks placed in canals? How do they operate?

Did you ever see any work that had been erected by the government to aid navigation? If so, what was it?

to the Pacific coast. With the exception of the Canadian Pacific and the Grand Trunk Pacific, these lines are within the United States.

The great wealth of this highland region lies in its mineral resources, of which gold, silver, and copper are the most important. Since 1880, the gold and silver taken from these regions has amounted to more than \$6,000,000,000, and the average annual output still exceeds \$106,000,000. The location of the best of these mines has caused towns to spring up in their vicinity, some of which, like Leadville and Virginia City, for the time, became important industrial centers. Coal measures also extend along the eastern border of the Rocky Mountains, but they are still awaiting development. Ore from which radium is obtained is found in Colorado and Utah, and extensive beds of oil shale are a valuable source of petroleum.

### **The Pacific Slope**

West of the Rocky Mountains, and separated from them by the Columbian Plateau and the Great Basin, we find the Sierra Nevada and Cascade Mountains—two of the loftiest ranges on the continent. Many of their peaks attain an altitude of 12,000 to 15,000 feet, and are covered with snow throughout the year. Between these mountains and the sea are the parallel Coast Ranges. The intervening valleys constitute some of the most fertile farming country in the world. The most important of these are the Sacramento and the San Joaquin basins, which extend into the southern part of California; others extend northward into Oregon. Several streams have cut their way through these coast ranges to the Pacific, the most important being the Columbia.

The western slope of these mountains is well watered, except in the south, and their sides are heavily timbered from far in the north to the dry region of southern California. In Oregon and Washington a thriving lumber business is carried on in the mountain regions, while the fertile soil of the valleys produces abundant





WATER FRONT, SEATTLE

FOR ALASKA  
WATERFRONT







Copyright, 1905, by Georg Thorne-Thomsen

RELIEF WA





250 Miles





crops of wheat, oats, corn and fruit. The valleys of California, in the northern and central portions of the state, grow excellent cereals and deciduous fruits; while the southern portion has become the most important fruit region of the country. Most of the farms in Southern California are watered by irrigation.

It was in one of these valleys in Central California that gold was discovered in 1848, and this discovery caused such a flood of immigration that California became a state in 1850, some years before the vast territory between the Mississippi and the Rocky Mountains was even open to settlement. Since the discovery of gold within her borders, California has been one of the leading gold-producing regions of the world.

The Pacific coast line is much more regular than the Atlantic. San Francisco Bay and Puget Sound are the best harbors. On the first we find San Francisco, which is the commercial and financial center of the Pacific States, while Seattle, Tacoma, and Portland are important ports on the Sound and the Columbia River. Los Angeles and San Diego, the seaports of Southern California, are on the border of the richest citrus fruit region in the world. Steamers ply regularly between Seattle, Portland and San Francisco, and between San Francisco, Los Angeles and San Diego, also between these ports and the Atlantic ports of the United States and the Pacific ports of South America. All Pacific ports have regular steamship connection with Hawaii, the Philippines, China, Japan and Australia.

**CLIMATE** The latitude of the United States is such as to give the country a climate ranging in temperature from semi-tropical in the extreme south to cool temperate in the north. East of the Rocky Mountain Highlands the temperature is affected but little by the altitude of the country, the low ranges of the Appalachian Mountains having only a local influence. The direction of the mountain ranges allows north and south winds alternately to sweep over the vast interior, which subjects this





# ANNUAL RAINFALL

IN INCHES

region to sudden and sometimes extreme changes in temperature during the spring and autumn months. In the northern half of the country the winters are cold and the summers hot.

The great altitude of the Rocky Mountain Plateau gives to the entire western highland region a cooler climate than it would otherwise have. The Pacific Slope is influenced by the warm winds blowing over the Pacific, and has a warmer climate than places of corresponding latitude on the Atlantic coast. This region also differs from other portions of the country in having only two seasons, rainy and dry.

**Rainfall** The eastern half of the country has, without exception, an annual rainfall of more than twenty inches, and the precipitation is quite evenly distributed throughout the year. Both of these conditions are of great advantage to agriculture. A glance at the map shows that the Appalachian Highlands and Coastal Plain receive an average of from forty to sixty inches of rain, while two small areas, one on the Gulf of Mexico and the other in the mountainous regions of North Carolina and Tennessee, have more than sixty inches. The 100th meridian separates that portion of the Mississippi basin, which is suitable for agriculture, from the western portion which, on account of the lack of rainfall, is suitable for grazing only. A few narrow valleys among the Rocky Mountains receive a good supply of rain, but most of this region is dry because the altitude of the Sierra Nevada and Cascade Ranges is such that air currents on the eastern slope are given a downward direction and are constantly growing warmer and having their capacity for moisture increased by dry winds blowing inland. The western slopes of these mountains and the intervening valleys are well watered because the incoming winds from the ocean are forced to rise over the mountains, and, being cooled, they precipitate their moisture, consequently, a section along the coast in Washington, Oregon, and Northern California

receives more than sixty inches of rain annually. In general, the rainfall on the Pacific coast diminishes from Washington southward, and the southern part of California falls within the arid region. Here intensive farming is successfully followed by means of irrigation.

This diversity of surface, soil, temperature, and rainfall, divides the United States naturally into well defined industrial regions, and the leading occupations in each have been determined by geographical conditions.

### QUESTIONS.

What advantages do the United States derive from their geographical position? Are any other countries similarly situated?

How do you account for the numerous good harbors on the Atlantic coast?

What is the fall-line? Account for its location.

What portions of the Appalachian Highlands are best suited to agriculture? Why?

Over what routes did the people who first settled Ohio, Kentucky and Tennessee cross the mountains?

What are the boundaries of the prairie region in the United States? Why is this region so well adapted to agriculture?

Why are not the Great Plains as well suited to agriculture as the prairies?

Describe the climate of the Rocky Mountain region. How do you account for it?

How do you account for the heavy rainfall in some portions of Washington, Oregon and in the northern part of California?



## CHAPTER II

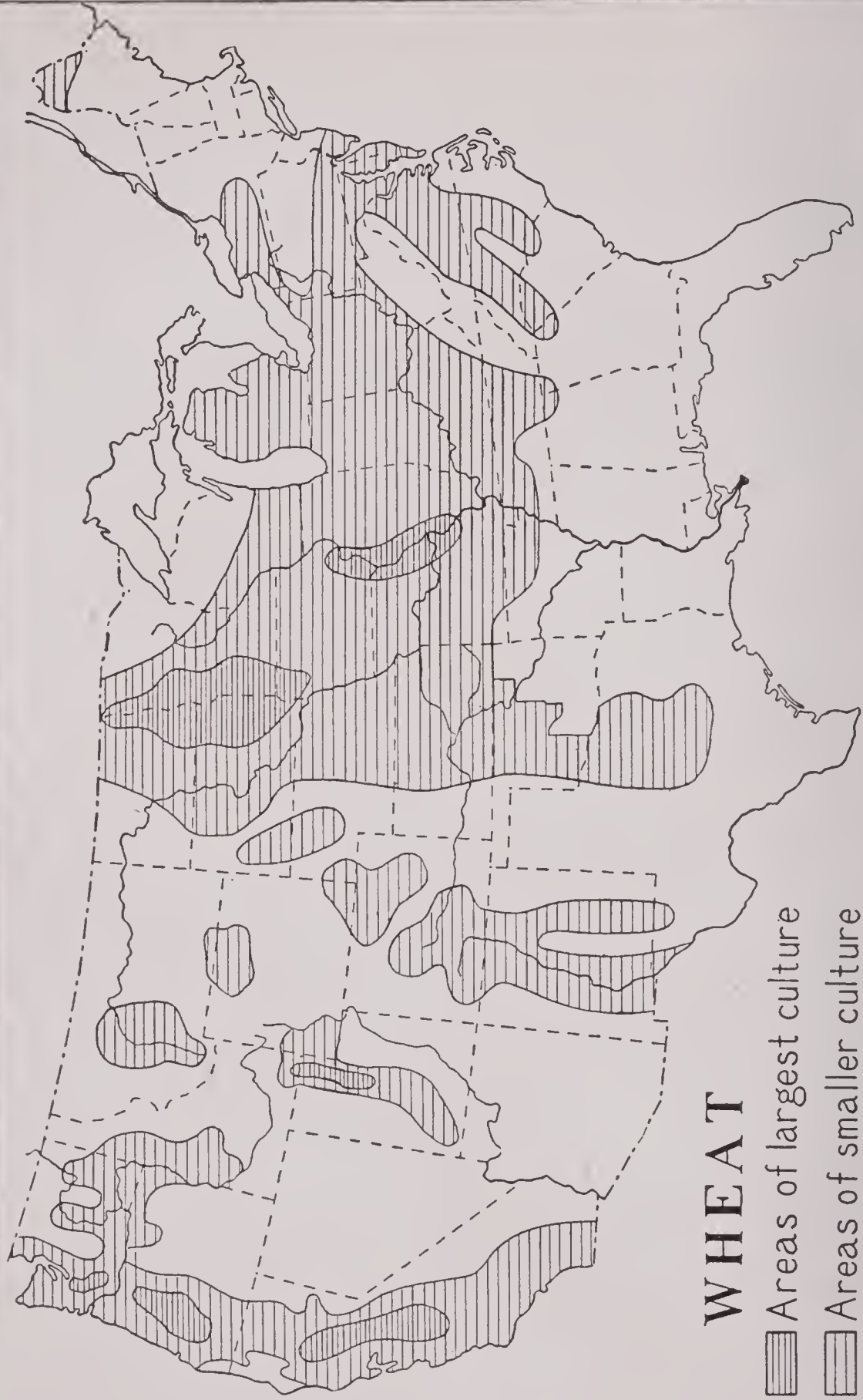
### WHEAT

Wheat is one of the most valuable cereals and has been known from the earliest history. It was extensively cultivated by the Ancient Egyptians, and China knew it and used it more than 2000 years B. C. It also constituted an important article of food of other nations of antiquity. From that time to the present, wheat has been the principal food for civilized peoples. Its origin is not known, but its home is supposed to have been somewhere in Western Asia.

#### THE WHEAT PLANT

Wheat is adapted to a great variety of soils and climates, but thrives best in a soil formed from the decomposition of different kinds of rock that have been thoroughly pulverized and contain a good amount of humus, or vegetable mold. Such soil is usually found in river basins, the beds of old lakes, and occasionally on the lower slopes in hilly regions. The plant requires a medium amount of rainfall, and the great wheat-growing regions are those that have from twenty to forty inches of rain annually, about thirty inches securing the best results, provided the rain falls so as to supply the crop with water during the growing season. The plant should also secure its growth during cool weather either in early spring or late fall. Wherever these conditions of soil, rainfall and temperature exist, wheat can be successfully grown. These conditions are so varied over the wide range in which the plant is cultivated that a great many varieties have been produced, but these can all be grouped under two classes, winter wheat and spring wheat.





**Winter Wheat** Winter wheat is so called because it is sown in the autumn and remains in the ground until the next season. The time for sowing ranges from early in September to late in October, according to the locality and climatic conditions. In the warm portions of the wheat regions it is sown earlier than in the cooler portions. Winter wheat gets a good start in the fall months and matures in June or early in July of the following season. It is well suited to those localities that have a dry hot summer, as the conditions of climate necessary to its successful growth and maturity are met by sowing in the fall. Winter wheat is generally sown in the warm portions of the wheat belt, both in the United States and other countries. It yields well, and makes a good grade of flour.

**Spring Wheat** Spring wheat matures in less time than winter wheat, and can be sown in the spring and harvested in the following July or August, except in the coolest portions of the spring wheat belt, where it does not reach maturity until the first of September. It is sown as early in the spring as the ground can be worked, and attains most of its growth during the hottest part of the season, maturing during the later summer months. There are numerous varieties of spring wheat, such as the red and the white, and the small berry and the large berry. In general, it furnishes a harder berry than winter wheat, and makes a flour of better quality. This wheat is adapted to the cool temperate regions, and can be grown successfully as far north as Hudson's Bay.

**THE WHEAT COUNTRIES** At the outbreak of the European War in 1914, the leading wheat-producing countries of the world were the United States, Russia, British India, Canada, Argentina, Austria-Hungary, Germany and Roumania. Russia, Canada and Roumania were the only foreign countries that raised more than enough for their own consumption.





HARVESTING WHEAT IN NORTH DAKOTA



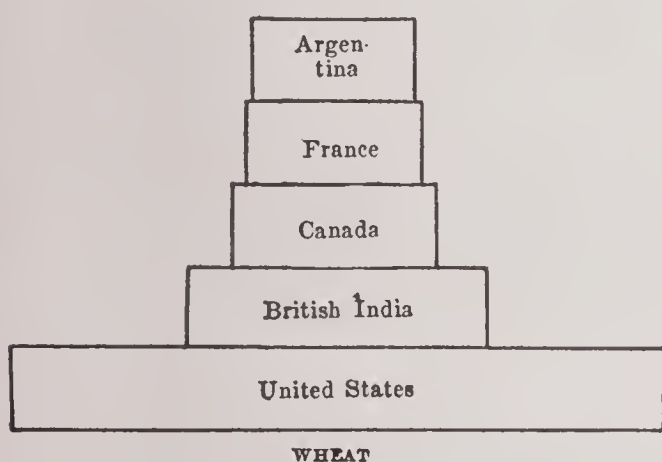
The United States, Canada, Argentina and British India are the only important exporting countries since the war. Before the war Russia led the United States.

## THE UNITED STATES

Wheat culture in the United States began with the earliest colonization. This cereal early became the staple of the New England and

Southern colonists, and it was successfully grown by the French in the Mississippi valley many years before the war which gave that region to the English. Wheat culture in this country has always

followed the tide of immigration, until now the grain is raised in every state in the Union. In twenty-five of these winter wheat is grown, and in nineteen spring wheat, while some produce both varieties. The conditions favorable to the production of wheat in the United States are found in the entire basin of



the Red River of the North; the upper portion of the Mississippi basin as far south as the Des Moines River in Iowa; the Illinois River in Illinois, the flood plains of the Arkansas, and rivers of Kansas and Oklahoma; in Indiana as far south as the Wabash; all along the Lake Erie Slope of Ohio and New York, and in the Columbian Plateau and Sacramento basin on the Pacific coast.

## The Spring Wheat Belt

The basin of the Red River of the North and the Mississippi basin as far south as

Des Moines, constitute the spring wheat region. Here the winter is long, the spring late, and the summer short. Wheat planted in the spring has opportunity to attain its growth before the hotter weather sets in. The period in which it ripens is usually free from rain, which assures the gradual maturing that secures the excellent grade of wheat for which the region is noted.



**The Red River Basin** The most important wheat region of the United States, and of the world, is in the basin of the Red River of the North and extending into Canada. Here are found the most extensive wheat farms in the world and here is raised the best quality of spring wheat.



WHEAT HEADER AND THRASHER

These farms are managed in the most systematic manner possible and the greatest care is taken to avoid waste of both labor and material. Formerly horses or mules were used for plowing, but on many of the larger farms gasoline traction engines have taken their place, and plows turning from ten to twenty-five furrows at a time are used. These engines are also used for harvesting. The plowing is done in the fall, and the seed is sown as early in the spring as the thawing of the ground will permit. This work is done by seeders which plant the seed and cover it at the same time. Harvesting

takes place from the middle of August to the tenth of September, according to locality. The grain is cut and bound by self-binding harvesters. As harvesting must be accomplished within a short time after the grain is ripe, and a harvester can harvest only about ten acres a day, each farm requires a number of these machines. The modern harvesters carry the sheaves until a number are collected, when they are dropped. Workmen follow the binders and stand the bundles in groups called stooks, or shocks, so that they will dry as soon as possible. In some sections the wheat is stacked before thrashing, but in most cases it goes directly from the stook to the thrasher.

As soon as the wheat is dry, it is thrashed. This work is done by steam thrashers which clean the grain, and with but little assistance stack the straw. The machines are driven by twelve-horse power engines, and will thrash from 1200 to 1500 bushels in a day. As the grain comes from the thrasher it is hauled to the granaries, or if sold, to the nearest elevator.

Instead of marketing his wheat at the time of thrashing, a farmer may hold it until late in the season. If the price is good, it is to his advantage to market it at once. In either case it is shipped from the local elevator to some of the large wheat centers. The most important of these are Minneapolis, Duluth, Chicago and Buffalo. In these cities are found elevators capable of containing from 500,000 to 6,000,000 bushels of grain each. These are used for storing the wheat until it goes to the mills. Some of these large elevators are made of wood, but the later patterns are of steel, tile, or concrete, and are in the shape of huge tanks. Concrete is used in the construction of the elevator shown in illustration facing page 1. The elevators contain the most ingenious labor-saving devices for the handling of the grain; the labor expended upon it being confined to operating the machinery.

This is well illustrated by an elevator at West Superior, Wis.



This building is 230 feet high, and 135 feet wide, and is built entirely of steel. It cost over two million dollars, and will contain more than three million bushels of wheat. The machinery is such that with the labor of a few men, 600 cars of grain can be unloaded in a day. This means the handling of 400,000 bushels. As the wheat leaves the car, it is dropped into the basement where it is caught up by a series of buckets on an endless chain and carried to the top of the building, and put into bins which hold from 7500 to 15,000 bushels. Before being placed in the bins the wheat is weighed so that the exact amount is known. From the bins it is loaded directly into boats for shipment to Buffalo.

**The Winter Wheat Belt** This includes that portion of Iowa south of the Des Moines River, and the wheat growing portion of Kansas, Nebraska, Oklahoma, Indiana, Illinois and Ohio. The climatic conditions here are quite different from those in the spring wheat belt. The summers are long and hot, and the winters mild. If wheat were planted in the spring, it would grow during the hot weather of June and July, and the plant would produce a large quantity of straw and very little grain and that of poor quality. Many of the wheat farms of Kansas are large, and in some years that state has even led North Dakota and Minnesota in her production of wheat. Each of the other states also produce several million bushels. In Illinois and Indiana the farms are smaller, and in Ohio the cultivation is on small farms, largely on the plan of intensive farming, which secures a large yield per acre. Considerable wheat is also grown in western New York on the same plan.

**The Pacific States** On account of the peculiar climatic conditions of California, Oregon and Washington, this region furnishes a grade of wheat of high quality, but somewhat different from that grown in other portions of the country. Most of this is winter wheat, but on account of the

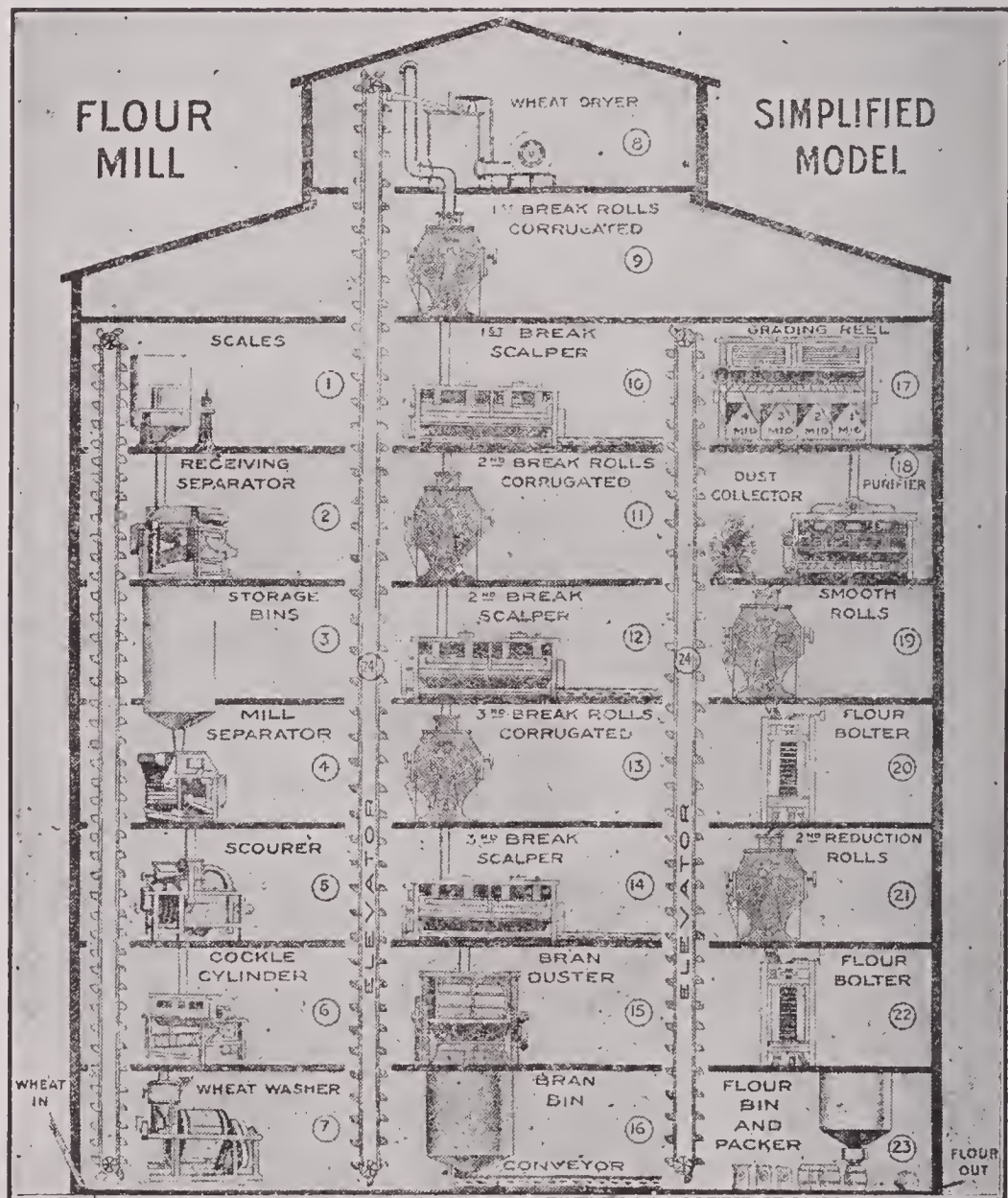


dryness of the climate the berry becomes nearly as hard as that of some spring varieties. The harvesting here is somewhat different from that in the valley of the Red River of the North. The grain becomes thoroughly dry before cutting, and in many places the harvester used cuts only enough of the straw to secure all the heads. The thrasher is attached to the harvester, so that the harvesting and thrashing are done at the same time and by the same machine. One of these machines requires the equivalent of twenty-two to twenty-four horses to operate it. The grain from this region is all sacked before shipping, and this has given rise to a thriving industry in the manufacture of gunny sacks. Most of this wheat is ground in the states where it is grown, and the flour is exported to China and Japan.

**Transportation** Wheat is transported by rail and by water. With the exception of that on the Pacific coast, it is carried in bulk, being run directly from the elevators into the car or ship, as the case may be. The average freight car will contain 675 bushels, and the task of moving a large crop taxes the railways to their utmost capacity. Transportation by water is much cheaper than by rail, consequently, much of the wheat destined for European markets is shipped to Duluth or Chicago, and thence by water to Buffalo where it can be reloaded into canal boats and carried to New York via the Erie Canal and Hudson River. Many of the steamships on the Great Lakes can carry cargoes of more than 250,000 bushels.

**FLOUR** The wheat berry, or the kernel, as it is commonly called, has a somewhat complex structure. If a kernel is carefully split through the middle, and the exposed surface examined by a powerful microscope, we find that the inside of the berry is filled with white granules of almost pure starch. Surrounding this is a coating which has a yellowish tint. This coating is nearly all gluten, the most nourishing and valuable part

of the berry. Outside of the gluten is a covering of bran. This is arranged in five coats, each differing from the other in structure and appearance, but all are made up of wood fiber, wholly worthless

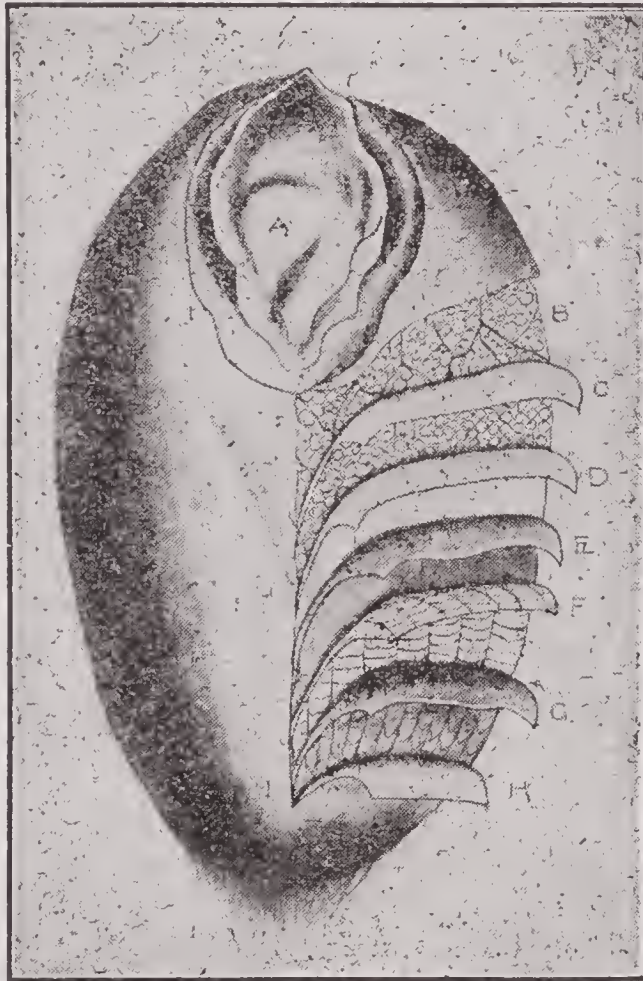


(Courtesy Washburn-Crosby Co., Minneapolis, Minn.)

as an article of food. At the one end of the berry, and within the bran coats, we find the germ, which must be separated from the other parts in order to obtain flour of the best quality.



**Milling** The milling of wheat has for its purpose the crushing of the berry and converting the starch and gluten into flour. When the wheat enters the mill, it is first cleaned, during which process all imperfect kernels and seeds of other



DISSECTED WHEAT KERNEL, MAGNIFIED

(Courtesy Washburn-Crosby Co.)

- |                            |                                   |
|----------------------------|-----------------------------------|
| A Germ                     | E Tester, coloring matter of bran |
| B Gluten cells predominate | F Endocarp                        |
| C Starch cells predominate | G Epicarp                         |
| D Interior coat of bran    | H Epidermis                       |

plants are removed. The dust is then removed by running the wheat through a series of rapidly revolving brushes, through which is passed a blast of air. In some of the best mills the wheat is



steamed a short time before grinding. This prevents the bran from breaking into such small particles that, when ground, it cannot be separated from the other parts of the berry.



PACKING ROOM IN A LARGE FLOUR MILL

The wheat is ground by passing through series of steel rollers, those in each set being closer together than in the one preceding. After being thoroughly ground in this manner, it passes through the separators which remove the bran and the germ. Several grindings and siftings still follow before the flour is perfected. It is then exposed to a blast of air to cool it, when it is ready to be

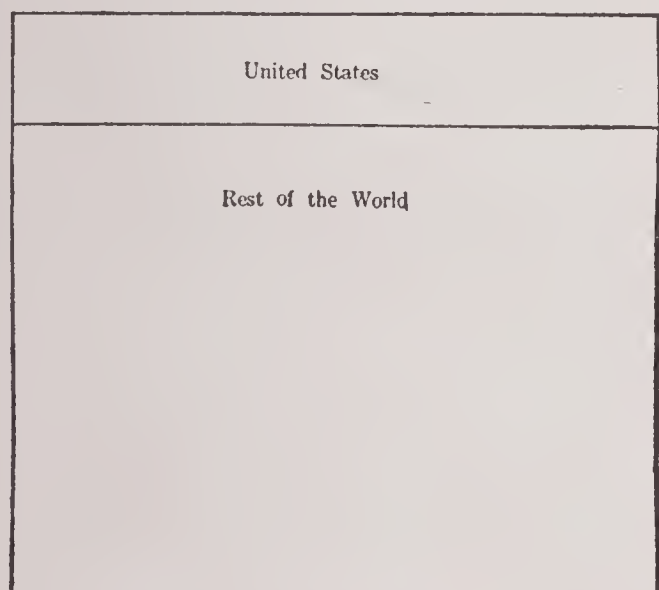


packed for shipment. Flour is packed in barrels and sacks. A barrel of flour weighs 196 pounds; the sacks are of half-barrel, quarter-barrel, and eighth-barrel sizes. It usually requires four and a half bushels of wheat to make a barrel of flour.

The large milling centers are naturally near or at the large shipping centers, but we find small mills located all over the wheat belt. To these mills many farmers sell their wheat, and from them flour is sent, not only to supply the local trade, but to many distant cities and states, and sometimes to foreign countries. The capacity of these small mills ranges all the way from 100 to 1000

barrels a day. Minneapolis is the greatest milling center of the world. In this city are found single mills capable of producing 15,000 or more barrels of flour in 24 hours, and the full capacity of this milling center is more than 60,000 barrels a day.

The United States is the leading wheat-producing country of the world. It



WHEAT

now raises one-fifth of the world's supply, and the tendency is to increase rather than to diminish this output. Our position as a wheat country is due, not only to the vast extent of our wheat lands, but to the ingenuity of American inventors in producing, and the intelligence of the American farmers in using, our agricultural machinery, without which the cultivation of the great farms would be an impossibility. The only other country that approaches the United States in this respect is Canada, where we find the same thrift, energy, and intelligence as in the United States. Our annual production of wheat is about 900,000,000

bushels. The value in 1915 was \$912,887,793. Previous to 1915 the leading countries in this trade were Russia, Argentina, British North America, Africa and France; while the largest purchasers of flour are the United Kingdom, Holland, China, Cuba, and the West Indies. Small quantities also go to Brazil, Japan, and Africa. The average consumption of wheat in the United States is about four and a half bushels for each individual, and it requires about two square feet of land to raise enough wheat to make a loaf of bread weighing a pound.

### QUESTIONS

What are cereals? Why are they so called?

Between what parallels of latitude are the great wheat countries of the world situated?

Is wheat raised in your vicinity? If so, is it spring or winter wheat?

What inventions have contributed to make the United States the greatest wheat-producing country in the world?

Why is wheat such a valuable article of food?

Make a list of all the uses of wheat?



## CHAPTER III

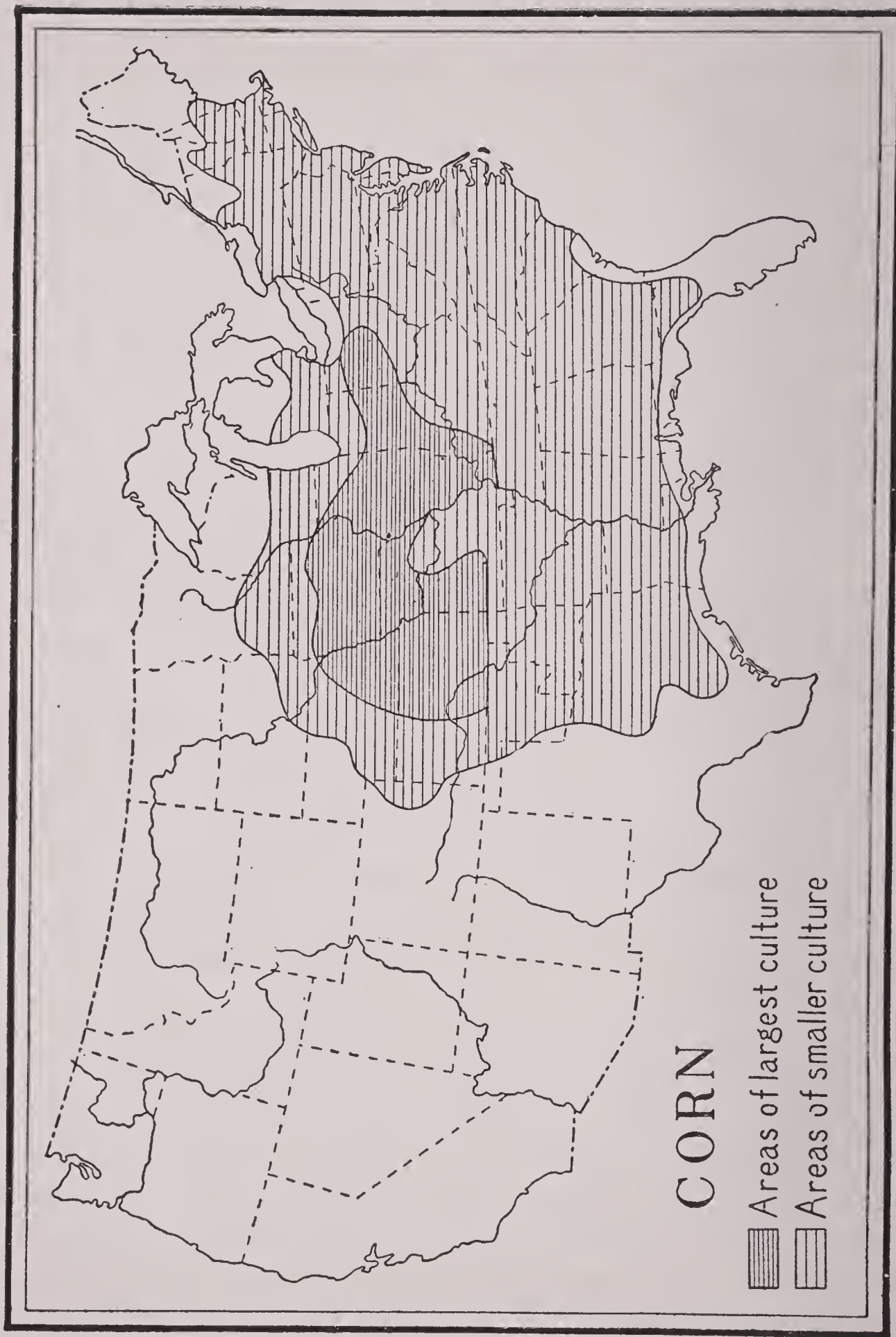
### CORN

In its broadest meaning the word corn applies to all cereal grains. The Scotch call oats corn; to the Englishman an ear of corn signifies a head of wheat; while in some of the countries of Northern Europe, rice and corn mean the same thing. But in the United States the word means Indian corn, or maize.

**HISTORY** Corn is the cereal of the New World. When America was discovered, the natives were found using various preparations of this grain, and it was from this beginning that the use of corn was extended until it has reached its present limit.

Corn was originally a semi-tropical plant, but the rude method of cultivation by the Indians extended its area as far north as New York and the New England States, and now by far the greatest quantity is raised in the temperate regions of the Old and New Worlds. Besides the United States, we find the countries of Southern Europe and India now raising considerable quantities of corn, and its cultivation has been introduced into Argentina and other countries.

**THE CORN PLANT** Corn is a tender plant, and at any period of its growth it is easily damaged by frosts. The seed cannot be planted until the season is sufficiently far advanced to allow the growing corn to escape late frosts, and the region in which it is grown must have a late warm autumn, almost without rainfall, otherwise the grain will not ripen. Corn thrives best on a rich loam, and most of it is raised on a heavy clay loam composed of finely ground rock from which the plant





food has not been washed. The plant produces most abundantly where the rainfall is from thirty to forty inches, falling mainly in spring and winter. It thrives much better on dry land than on that which is wet or abundantly moist. Since the plant absorbs a large quantity of moisture from the atmosphere, it often thrives in localities where the rainfall is not sufficient for the best results in raising wheat, oats and other small grain.

There are many varieties of corn, each of which seems to be suited to a definite purpose, and some are especially adapted to certain localities. The small, hard, yellow corn will mature in a shorter season than some of the larger varieties, and can be successfully grown in New England, and the northern parts of Wisconsin, Minnesota and the Dakotas. Sweet corn is raised for eating green and for canning, while popcorn is considered something of a luxury and is not raised in large quantities, although the crop when successful is more profitable than almost any other that the farmer can produce. When we speak of corn without any qualification of the term, the large dent corn is meant. The quantity of this variety raised in the United States exceeds many times that of all others combined.

### THE CORN BELT

Corn is grown in nearly all of the states east of the Great Plains, and in many of them a sufficiently large yield is secured to make the crop a profitable one; but in only a few does the raising of corn constitute the chief industry. These states form what is known as the corn belt, and are Iowa, Missouri, Kansas, Nebraska, Illinois, Indiana and Ohio. Within their boundary is produced nearly nine-tenths of all the corn grown in the United States, and within this region we find the conditions essential to the most successful cultivation of this grain. It will be noticed that a number of these states also belong to the wheat belt.

The wheat is grown mainly along the flood plains of the rivers

and in old lake bottoms where the soil is of the fine silt variety required by that grain. The corn occupies most of the land in this belt which is higher and drier. Therefore, except in Kansas, the wheat production in these states is very small compared with the corn crop.

**Tillage** We do not find in the corn belt any such large farms as the bonanza farms of the wheat region. In the eastern states, the farms are small, seldom exceeding 240 acres. But as one goes westward, he finds the average size to increase until in Western Iowa, Nebraska and Kansas, 400 or more acres may be included in a farm. There are a few exceptions to this rule, where a syndicate, or some enterprising farmer, has purchased a number of farms and operates them all under one management. Much that has been said about the treatment of land in the raising of wheat applies also to the raising of corn. The land is plowed and prepared for the seed in about the same way for both grains. Corn, however, is planted in rows so that the hills are equally far apart each way. One looking at a field of growing corn early in the season, notices that the rows run both ways and at right angles to each other, and that they are about three feet apart. When the corn is small this seems to be a waste of ground, but by the middle of the season the plants have become so large that the leaves of one hill touch those of the next.

The seed is usually planted from the first to the middle of May, according to locality. The work is done by a planter drawn by horses, and so gauged that it drops the seed and covers it at equal intervals of space, making the fields resemble a checker board when the plants appear. A careful operator will plant his field so regularly that the rows will be straight in each direction. The young plants are very tender, and when they have attained the height of five or six inches tillage begins. In order to keep the soil loose and moist about the roots, and to keep down the



weeds, the ground must be cultivated every week or two until the plants become so large that the cultivator can not be drawn between the rows without injuring the crop. The field is then laid by for the corn to fill and ripen. In respect to tillage corn presents a marked contrast to wheat which covers the ground so thickly that cultivation is impracticable.

This necessity for cultivating the land makes corn a more expensive crop to raise than wheat. In good soil the most thrifty plants attain a height of from sixteen to eighteen feet, but the average height is from seven to eight feet. Each stalk bears several ears. The yield varies from thirty or forty to as high as eighty bushels per acre, though the latter result is seldom attained. The crop is usually harvested about the middle of September, or it may remain standing longer if conditions make it necessary.

**Harvesting** Formerly the harvesting was all done by hand. Only the ears were collected from the stalks which were left standing, but now the corn harvester does the work in a manner quite similar to that of the self-binder employed in harvesting wheat. The bundles of corn are stacked in shocks for drying. Husking is commenced at the earliest possible date. Numerous machines have been invented for doing this work, but until recently they have not proved satisfactory, and most of the husking is still done by hand. This task is of such magnitude that it often engages the entire population for several weeks. After husking, the ears of corn are stored in cribs, which are large sheds having their sides made of narrow strips of board with wide openings between them, so as to permit a free circulation of air. The corn remains in the cribs until it is thoroughly dry, when it is ready for use.

**USES** While not as valuable as wheat, taken bulk for bulk, corn is more widely used because it is more suitable for so many different purposes. Corn is very wholesome and nutritious, and it is estimated that it is used as a food by a larger

number of people than any other cereal except rice. Its most extensive use, however, is for fattening stock, and we find that the states in which the corn belt is located supply our markets with a large number of hogs and cattle. In many cases where corn is fed to stock, it is not husked.

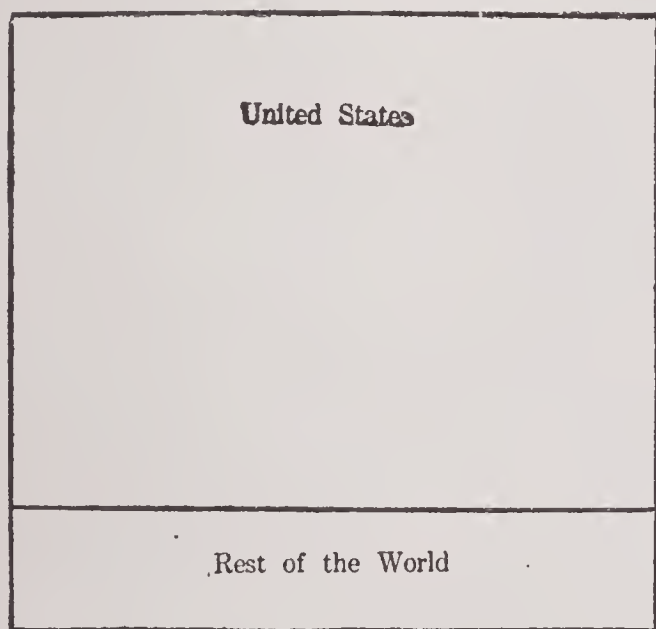
Corn is shelled or thrashed by machines driven by steam-power. The largest of these will thrash from 2500 to 4000 bushels in a day. It is only the shelled corn that is shipped from the regions in which it is grown. This constitutes about one-fourth of the crop, the other three-fourths being used for purposes already stated.

Corn is one of the most useful of plants, and from it a large number of products are made. When ground, the kernel forms meal, which is usually placed on the market in three grades, coarse, medium and fine, the last being nearly as fine as wheat flour. But before the kernel is ground into meal the hull and the germ are removed. From the germ, corn oil is made and the refuse when ground is placed on the market as gluten meal, and is a valuable stock food. The oil is used for lubricating machinery, in making paints, and when refined, as a substitute for olive oil for salads. But the most remarkable of all is that from this oil is made a good quality of rubber. One of the most important products obtained from corn is starch. The largest starch factories are at Oswego, N. Y., and on Long Island the annual output exceeds 20,000,000 pounds. Glucose is also of great importance and about 60,000,000 bushels are consumed yearly in its manufacture. It is extensively used in canning fruits. Mixed with ten per cent of cane syrup it forms corn syrup or karo. All are familiar with corn flakes, and hominy in its various forms is also widely known as a nutritious and wholesome food. When fermented, corn is one of the chief sources of alcohol and other spirituous liquors. Millions of bushels are consumed in their manufacture. The largest distilleries in the country are at Peoria and Pekin, Illinois.



In addition to many uses for which the grain itself is valuable, we find numerous uses for other parts of the plant. The stalks are nutritious and form a valuable fodder for cattle, either after they become dry or when they are green. In fact, the green corn in the form of fodder constitutes the principal feed for cows in many of the dairy districts of the country. For fodder, the corn is planted late in the season, and the crop is harvested when the ears begin to harden. The plant is cut into small pieces and packed into air-tight compartments, called silos, from which the feed is taken as needed during the winter. The pith is used in the manufacture of smokeless powder and for packing under the armorplate of warships. When

wet, the fiber swells rapidly, and in case of injury to the ship, it prevents leaking. The husks are employed in the manufacture of mattresses and for making some kinds of paper. In the fruit regions they are also extensively used in packing fruit. The cobs are used for fuel and in the manufacture of cob pipes, and a "corn down," which is formed in the manufacture of the pipes, is used in upholstery.



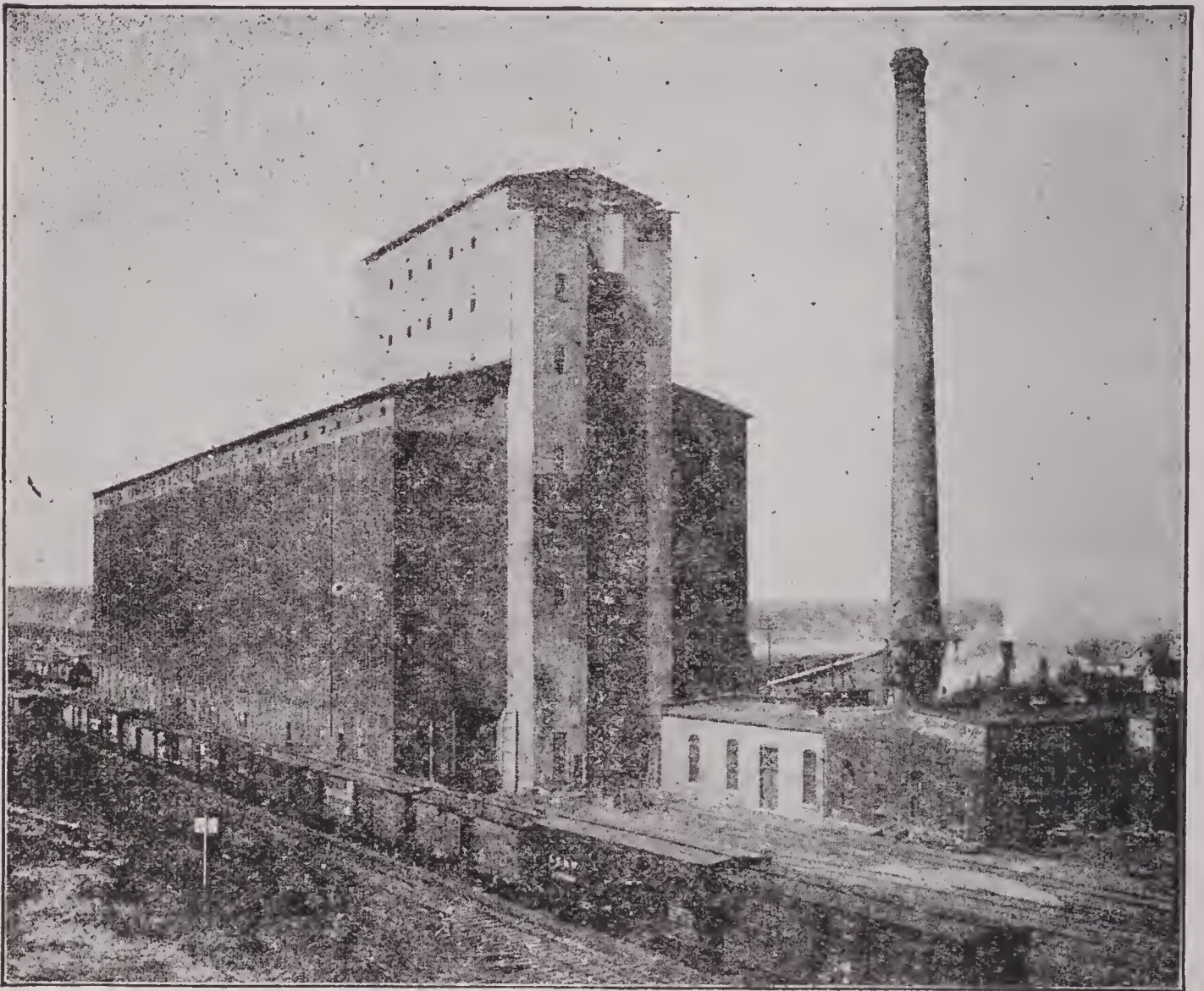
CORN

## PRODUCTION

The United States is the largest corn-producing country, raising three-fourths of the world's crop.

The growing of corn supports more people than any other branch of agriculture. In 1920 the corn crop amounted to 3,232,367,000 bushels and it was valued at \$2,189,721,000. This exceeds the value of the wheat and cotton crops combined, which are our two next largest agricultural products. Thus we

see that corn growing is our most important, as well as our most valuable, industry. The successful raising of this grain has given the states in the corn belt most of their wealth and also led to the establishment, within their borders, of many of the great



AN OLD STYLE ELEVATOR

industries now found there. The farmers of the corn belt are invariably prosperous, and most of them have acquired considerable fortunes by their industry. The people of foreign countries have not yet learned the value of corn to any great extent, and in order to market the vast crop raised in the country,



the farmers have to convert a good part of it into beef and pork.

The methods described for the marketing and transportation of wheat also apply to corn and need no further description.

### **OTHER CEREALS**

The other cereals forming important crops in the United States are rice, oats, barley, rye and buckwheat. Rice is grown in the South, especially in Louisiana and Texas, and in California. It requires a warm climate and low ground that can be flooded after planting. It constitutes one of the most valuable food plants in the world, and its culture is rapidly increasing in the United States. Oats grow farther north than corn or winter wheat, but thrive well in regions where spring wheat is raised. Barley has about the same range as wheat, and is extensively used in the manufacture of malt liquors. Buckwheat grows rapidly and matures early. It is valuable for fattening hogs, and the flour made from it is an important article of food.

### **QUESTIONS**

Of what use was corn to the Indians before they became acquainted with the white men?

How did the corn which the Indians raised compare in quality and quantity with that now raised in the best portions of the corn belt? How can you account for the difference?

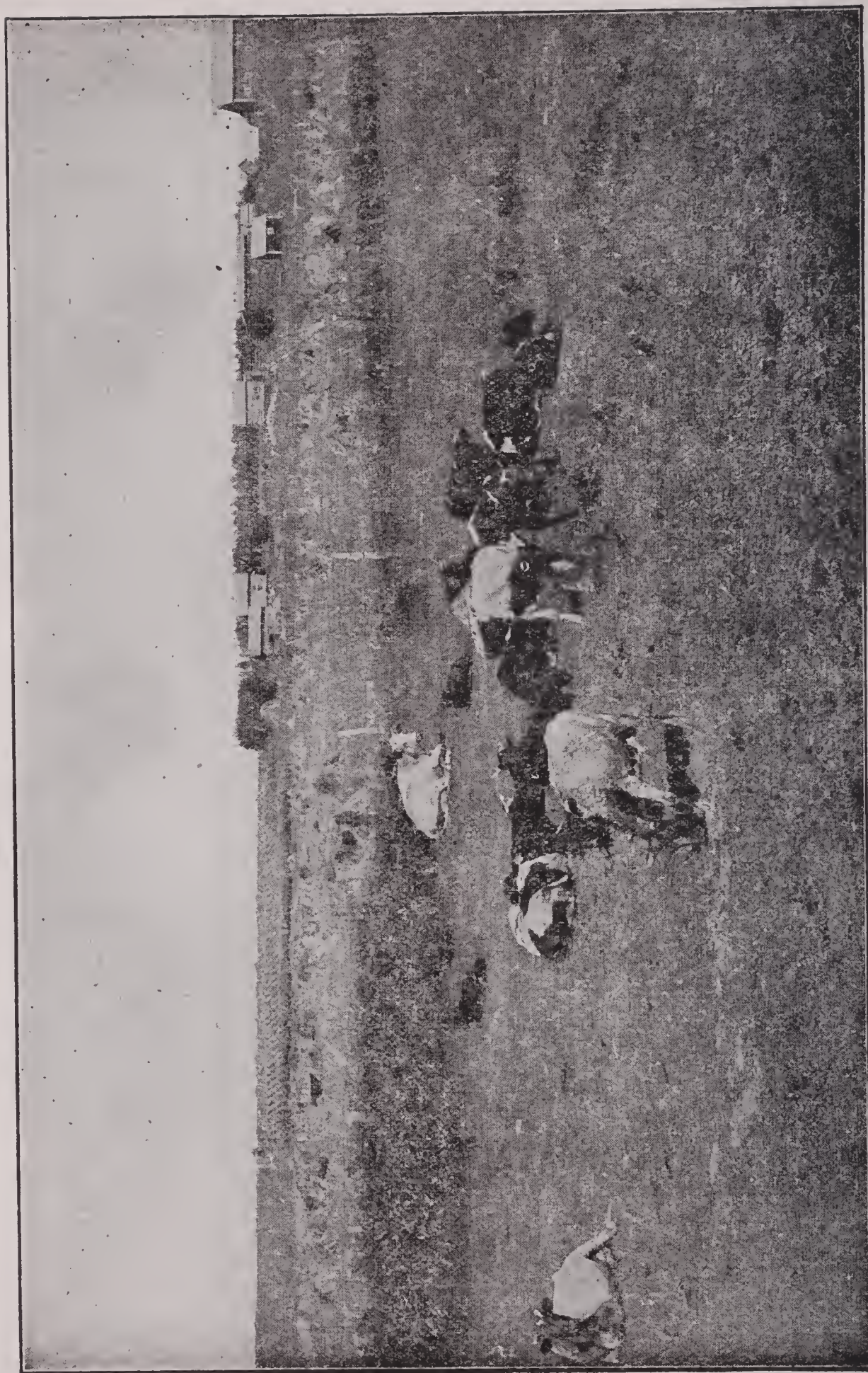
Which is the more productive plant, wheat or corn? Which is the more useful?

Why is wheat so much more extensively used in Europe than corn?

Name the most important purposes for which corn is used.

What other cereals besides wheat and corn constitute important crops in the United States?





A STOCK FARM



## CHAPTER IV

### LIVE STOCK

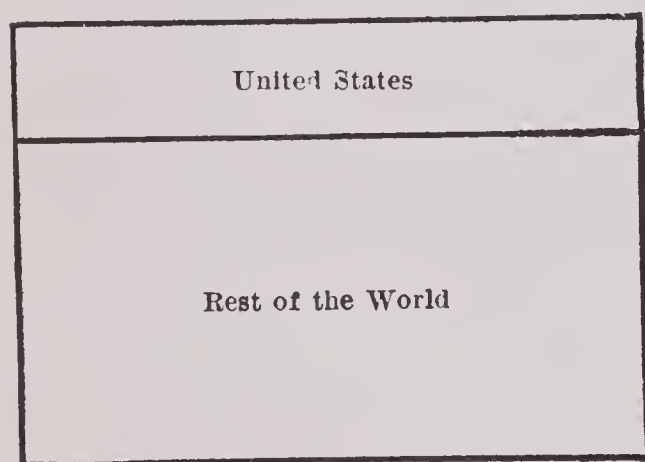
The raising of live stock is a valuable and important industry, and extends over nearly the entire agricultural portion of the country. Cattle are raised for beef and dairy products, horses for draft and driving, sheep for wool and mutton, and swine for pork. The important part of this industry naturally centers in those regions where conditions are especially adapted to its success.

The principal grazing regions are found in the western portion of the Great Plains, including most of Montana, east of the mountains, portions of Wyoming, the western part of Nebraska, Oklahoma and Texas. The region is semi-arid, having only sufficient rainfall to produce a good growth of grass. The climate is temperate, and remarkably well suited to stock raising. Late in the summer the grass dries and may be harvested and stacked like hay in other regions, or left standing for the stock to feed upon during the winter, as they feed upon the green grass in spring and summer. The grazing region is in marked contrast to the rich agricultural region to the east, and to which many of the cattle are sent for fattening before being marketed.

**DAIRYING**      Dairying is successful only in those regions where good crops of alfalfa, corn and grass can be grown, since the cows must have plenty of sweet, juicy feed in order to produce an abundance of milk of good quality. The best dairy conditions are found in the northern states bordering on the Mississippi. Of these Wisconsin and Iowa take the lead, producing a larger quantity of dairy products than any other states in the Union. They are followed by Minnesota and Illinois. Good dairy farms are

also found in the central part of Nebraska and Kansas, and in the northern portion of Indiana, in Ohio and New York. In the northern New England States dairy husbandry has replaced the general farming that formerly characterized the agriculture of that region. The United States contains about 22,000,000 milch cows, and makes about 1,622,000,000 pounds of butter, 320,000,000 pounds of cheese and 500,000,000 pounds of condensed milk a year.

Most of the butter and cheese marketed are made in factories. The butter factories are usually known as creameries. Each



CATTLE

creamery receives the milk from the cows of quite a large region, and makes butter on a large scale. The cream is separated from the milk by a machine called the cream separator. The separator revolves at a very high speed, and since the cream is lighter than the milk, it is brought to the top and flows out through a tube,

while the milk flows from a similar tube below. When in operation, a stream of milk flows into the separator, and streams of cream and skimmed milk flow out. Cheese factories also receive the milk from surrounding dairies, and operate on a large scale. Nevertheless, fully one half of the butter and cheese made in the country is made on small farms and wholly by hand labor. Most of this is consumed where it is made.

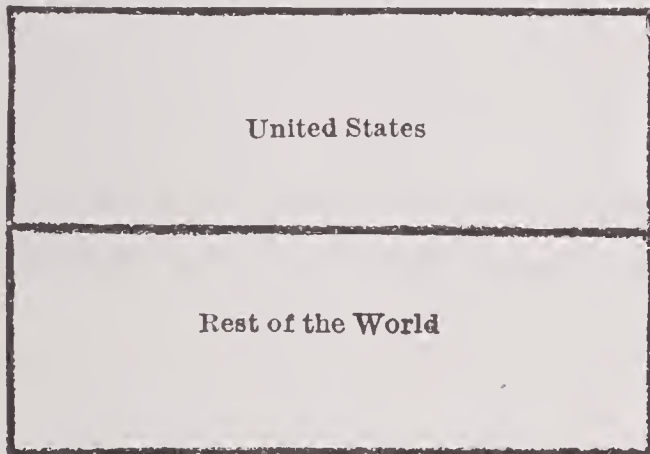
Jerseys, Holsteins and Ayrshires are the best breeds of cattle for dairy purposes, since their cows yield an abundance of milk of good quality, and the steers are easily fattened for beef. But while these steers make excellent beef, they are small and not as profitable for marketing as those of the larger breeds.



The total value of the dairy products is about \$2,768,000,000, which is greater than the value of the wheat, corn, and cotton crops combined. About one-third of the dairy products is exported.

## BEEF

Dairying and raising cattle for beef are two distinct branches of the livestock industry. Nevertheless, some states are noted for their dairy products and their beef. Formerly most of the beef cattle came from Texas and the states bordering on the eastern slope of the Rocky Mountains, because extensive grazing regions could be secured in these states at a nominal cost.



## HOGS

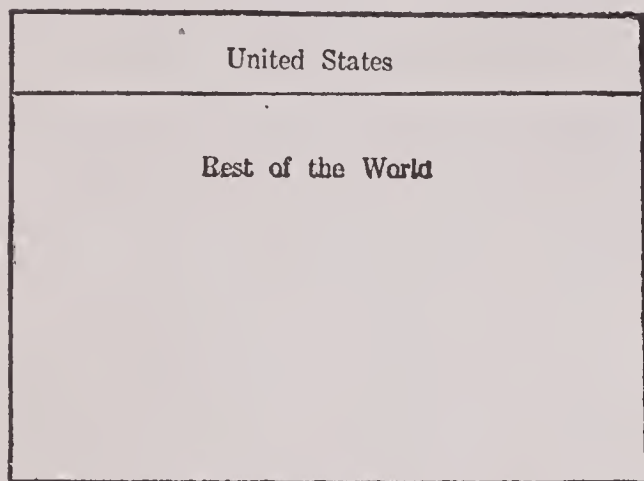
Missouri, Wisconsin, Minnesota, Oklahoma and Illinois. The Shorthorns, or Durhams, the Herefords, the Polled Angus and the Galloways are the best beef breeds.

Cattle are pastured until they are about three years old. Those that have become fat are shipped to market from the ranches. The others are usually sold to farmers in the corn-producing states, where they are fed on corn during the winter, then for a short time in the spring they are pastured on good grass, when they are ready for market. Many steers under two years of age are fattened and sold as "baby beef." This is the most choice beef on the market and it brings the highest price. There is less profit to the farmer in cattle over three years old, although they may have greater weight.

But now that large portions of these grazing regions have been placed under cultivation, the number of beef cattle in them has diminished and more cattle are raised in the corn-growing states. The leading states in the production of beef cattle are Texas, Iowa, Nebraska, Kansas, California,

**PORK**

The raising of swine is another important branch of the live stock industry. The United States contains about 68,000,000 of hogs, valued at \$571,890,000. They are raised most successfully where the grain upon which they are fattened



WOOL

is the most cheaply produced, consequently we find the largest number of hogs in the corn region. The Berkshires, Poland-China and Jersey Reds or Durocs are the most successful large breeds. The best animals from any of these breeds weigh from 500 to 600 pounds at the end of eighteen months. The Victorias, Essex, and Suffolks are the most common small varieties.

They mature early, but seldom exceed 300 pounds.

**MUTTON AND WOOL**

Sheep raising is profitable in dry, mountainous regions, where grazing is good, and we find these conditions among the foot-hills bordering the Great Plains, and in numerous valleys of the Rocky Mountains. The leading wool-producing states in the Rocky Mountain region are Wyoming, Montana, New Mexico, Idaho, California, and Utah. Texas, Ohio, Michigan, and New York are the leading states lying outside this region. While large portions of the former grazing regions have been placed under cultivation, the plan of leasing government lands for grazing purposes, under the supervision of the Bureau of Forestry, admit of large areas still being used for pasturage. There are about 50,000,000 sheep in the country and by far the larger number of them will be found within the grazing regions of the Great Plains and the Rocky Mountains.

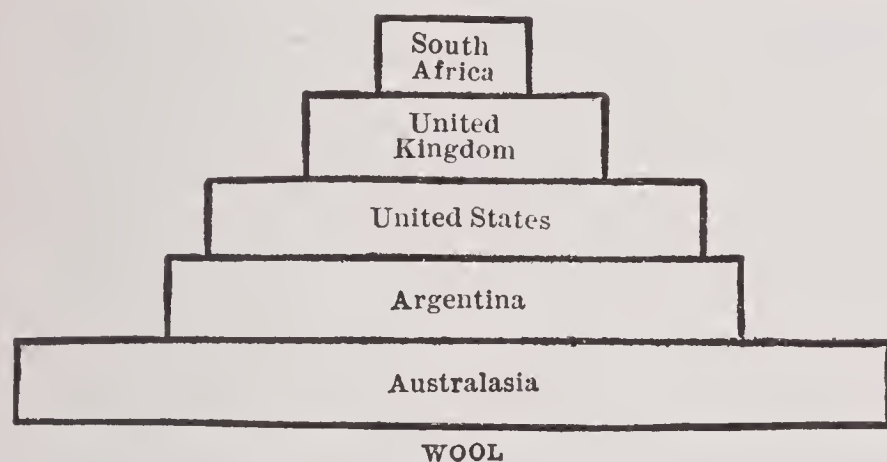
Sheep are valuable for wool and mutton, but sheep-growing regions are ranked in accordance with the amount of wool they produce. Wherever we find conditions similar to those described



above, we find wool-growing countries. Besides the United States, Argentina, Australia, New Zealand, and the States of the Union of South Africa produce the largest quantities of wool and mutton. All these countries are exporters.

Wool fiber is composed of small scales overlapping like the scales of a fish. The ease with which these move upon each other

makes wool and woolen goods very soft. It also causes the thread to shorten when wet, so that great care has to be taken when washing woolen fabrics to keep them from shrinking.



Sheep are graded in accordance with the quality of wool they produce, coarse-wooled, medium-wooled, and fine-wooled. Cotswolds and Leicesters are the best coarse-wooled breeds; Southdowns the best medium grade, and the Merinos the best fine-wooled sheep. Southdowns are the best for mutton, and Merinos are the poorest. Large numbers of sheep are slaughtered each year for meat.

In 1920 the wool crop of the United States amounted to 205,307,000 pounds, which is about one-sixth of the world's production. In addition to this amount 445,893,000 pounds were imported. The largest manufactories of woolen goods are in the New England and Eastern States.

## MARKETING

The meat-packing centers are located at Chicago, Omaha, Kansas City, St. Joseph, Fort Worth, Cincinnati, Sioux City, St. Paul and New York. Cattle are transported to these centers in stock cars constructed especially for the purpose. The cars are provided with troughs for feed and water,

and the trains are run so as to cover the distance in the shortest possible time. At each one of these centers are stockyards, into which the animals are unloaded immediately upon their arrival. Here they are sold to the packing-houses, and for export.

### **Slaughtering and Packing**

The large slaughtering houses and rendering establishments are situated in the midst of the stockyards, and animals destined for slaughter are driven up an inclined viaduct to the top of the building where they are killed. As the carcass of the animal passes from one process to another in the course of its preparation it descends, until finally the dressed sides are sent to the cold storage rooms on the ground floor.

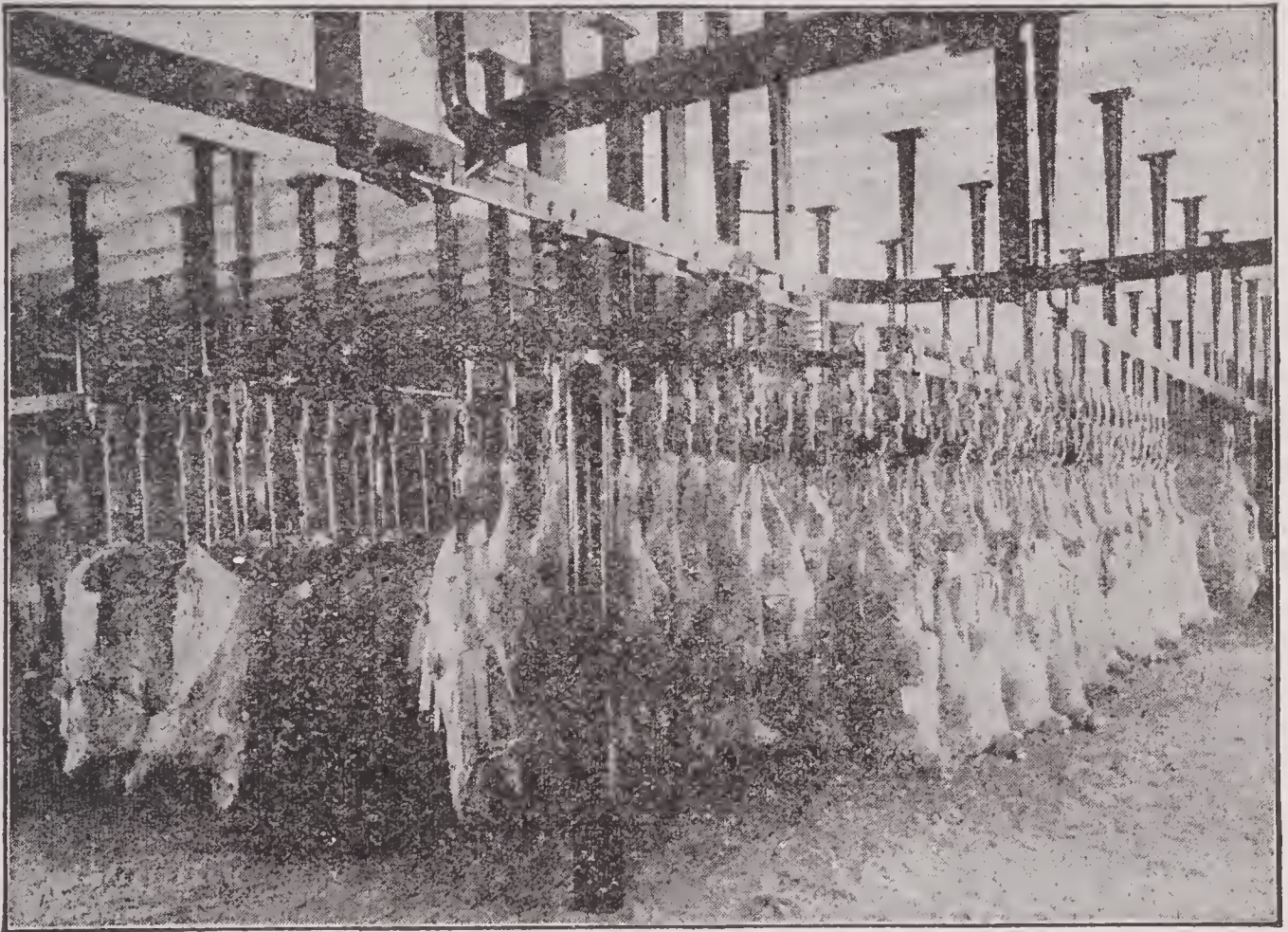
The system and despatch attending the work of slaughtering and meat packing are seldom equalled in any other line of industry. In some of the great packing-houses of Chicago, cattle are killed at the rate of eight a minute, which makes 4000 in a day. Within forty-five minutes from the time the animal is killed, the dressed sides of beef are hanging in the cold storage room, and they have passed through the hands of 150 workmen during the process of preparation. Hogs are killed at about the same rate, though the time required for dressing is much less. A single workman kills hogs at the rate of four a minute, and within twelve minutes after the pig is stuck his dressed sides are in the cooling room.

Excepting a very small quantity which is sold as fresh meat, the pork is prepared for use before shipping. This preparation consists in making it into sausage, bacon, salt pork, and pickled hams. Most of the beef is shipped in sides or quarters, which are transported in refrigerator cars. When exported to foreign countries, it is loaded from the cars into refrigerator ships so that it reaches its destination in as good a condition as though it had been killed at the market where it is offered for sale.

In no industry is greater care taken to prevent waste. Every



part of the animal is worked up into some useful product, which can be exchanged for value. The most important of these by-products are hides and leather, lard, tallow, glue, soap, and fertilizer. The horns and hoofs are made into combs and buttons, the bristles into brushes, and the hair into felt. The revenue derived from these sources is nearly sufficient to pay the expense of main-

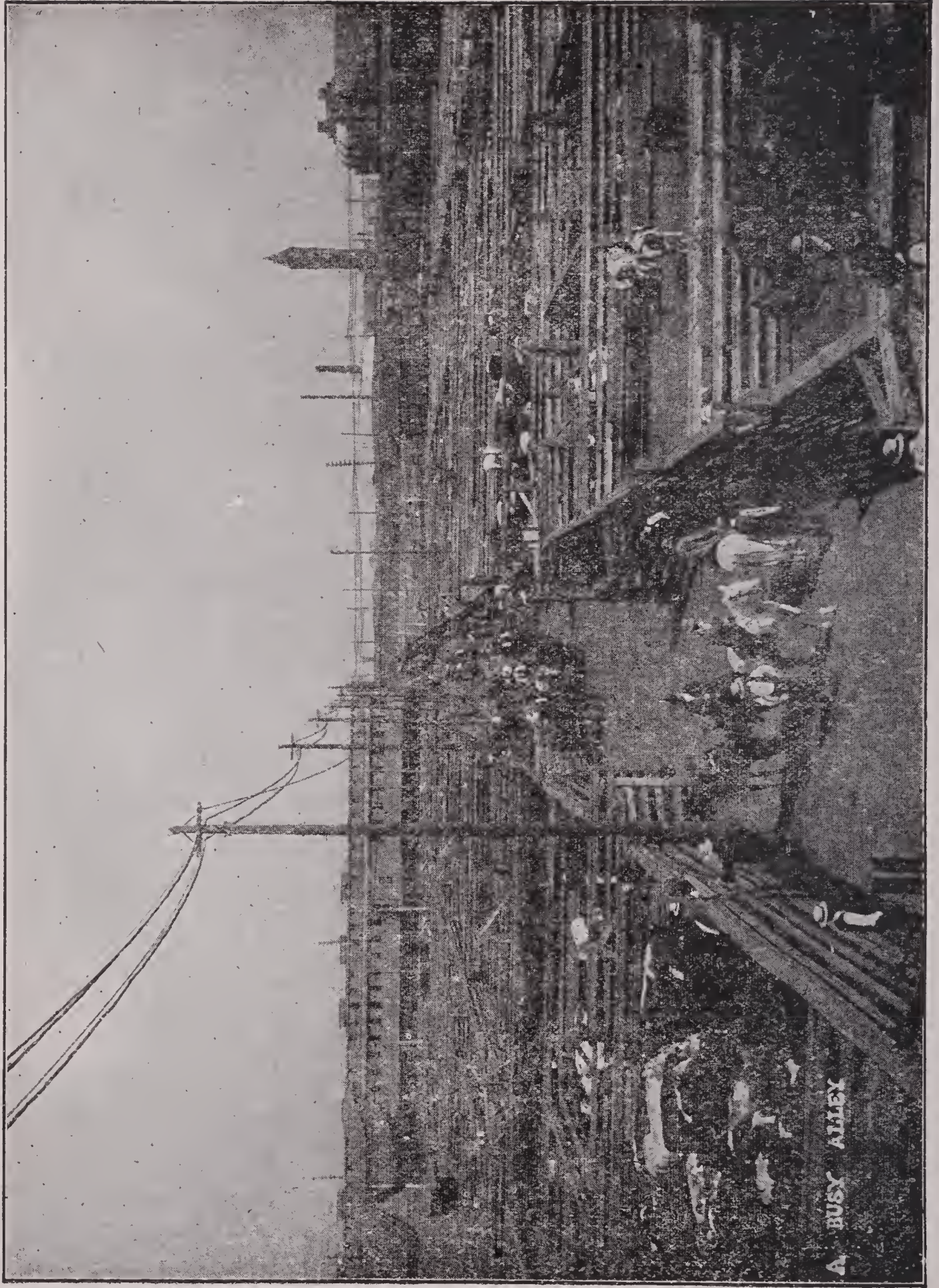


BEEF IN A COLD STORAGE ROOM IN A LARGE PACKING HOUSE

taining the rendering establishments, and without this it would be impossible to place the beef, pork, and mutton which they produce upon the market at the prices for which these articles are sold.

**VALUE** The United States produces more meat than any other country. About 20,000,000 cattle, 40,000,000 hogs and 14,000,000 sheep are slaughtered each year under government





A BUSY ALLEY

UNION STOCK YARDS, CHICAGO



inspection, and in addition to these large numbers of animals were slaughtered on farms and in small abattoirs. The value of the recorded output for the year was \$266,795,608. Chicago is the largest meat-packing center in the world. The other important centers in the United States, in the order of their output, are Kansas City, Omaha, Saint Joseph, Fort Worth, Sioux City, Indianapolis, Oklahoma City, and Wichita.

Owing to the increase of population in the United States and the placing of large areas of grazing land under cultivation, the export of meat products decreased rapidly between 1904 and 1914. In the latter year the European War began to change conditions, and such large quantities were exported to meet the demands of England, France, and a number of neutral countries, that the prices of all meat products became unusually high. After the war, prices declined slightly, but in 1923, they had not reached the pre-war level.

### QUESTIONS

What states lead in raising cattle? In raising sheep? Why?

How are great cities supplied with fresh milk?

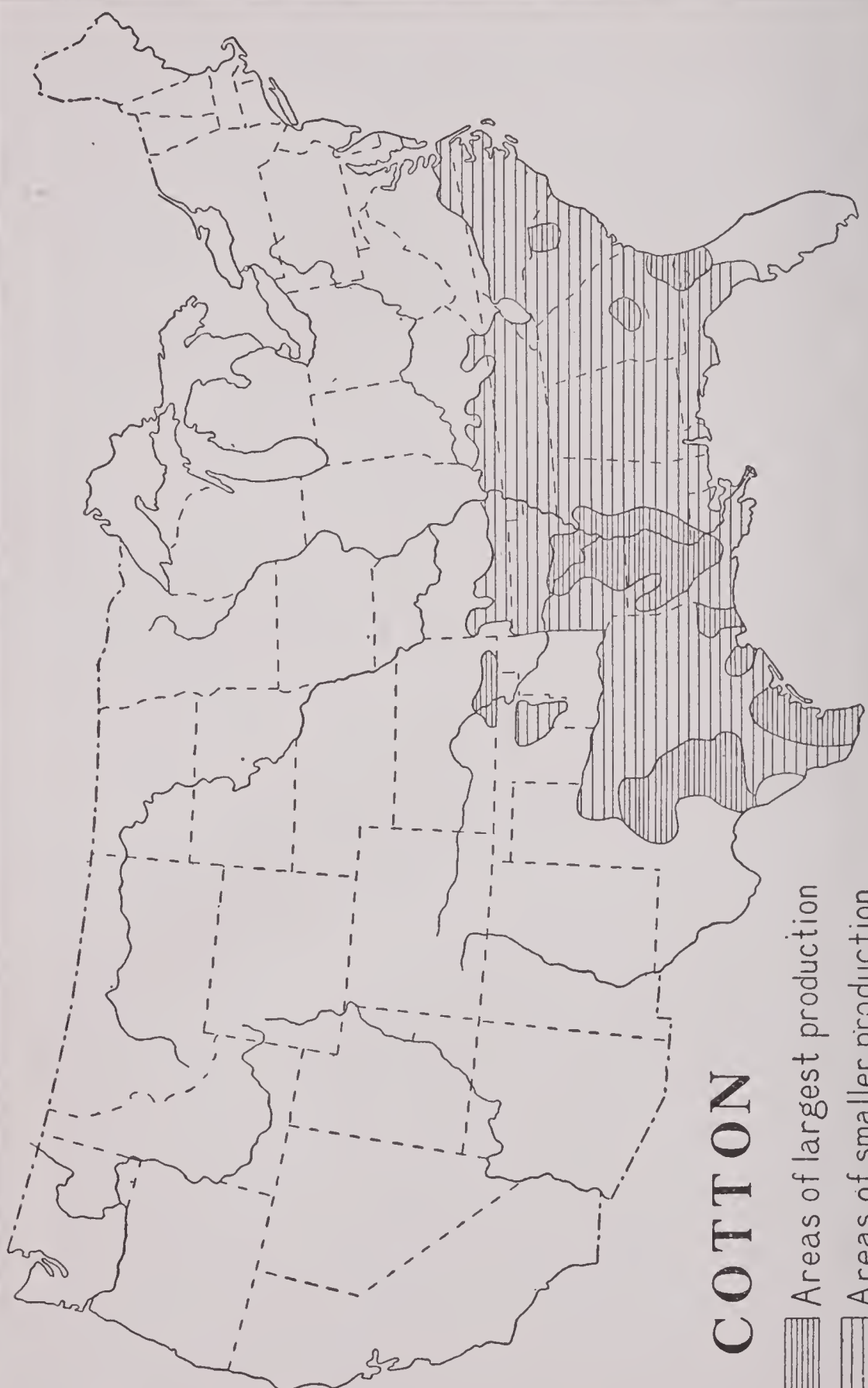
What localities supply our markets with the largest number of beef cattle?

With the largest number of hogs? What is the reason for this?

For what purposes are sheep valuable?

Why are the meat-packing establishments located where they are? What are the most important by-products of the packing houses?

How is dressed meat shipped to distant cities? To foreign ports?



# COTTON

- Areas of largest production
- Areas of smaller production



## CHAPTER V

### COTTON

**HISTORY** So far as we know, the fiber of the cotton plant was first used for making clothing in India. In records obtained from that country, bearing the date of 1000 B. C., we read that the people were clothed with a fine white cloth, which certainly means that they had garments made from cotton. Historians also generally believe that the ancient Egyptians cultivated cotton, and used the fiber in the manufacture of cloth, though no evidences of this industry have been found in their tombs or temples. Some of the early Roman writers refer to cotton as "tree wool," and they undoubtedly obtained this idea from the cotton tree of India. Cotton was introduced into China and Japan at a very early date, but it was not cultivated in these countries for general use until about the beginning of the fourteenth century. When the Mohammedans took possession of Northern Africa they extended the cultivation of cotton to this part of the world; and later, when they made the conquest of Southern Europe, they introduced the industry into the countries of the Mediterranean.

**In America** The cotton plant is a native of the New World. When Columbus landed on the West Indies, he found the plant growing there, and later the Spaniards found it in use in Mexico and Peru, where the natives had acquired considerable skill in the manufacture of cotton fabrics.

The first attempt to raise cotton in the American colonies was made in Virginia in 1621, but it was more than 175 years before the industry became at all important. During this period its growth was very gradual. By 1660, cotton was raised to a very

limited extent in both North and South Carolina. It was from these beginnings in Virginia and the Carolinas that its cultivation gradually spread to the other colonies whose climatic conditions were such as to make its culture successful. Previous to the Revolutionary War small quantities of cotton were raised in all the Southern colonies, and some was exported to England.

England was then, as she is now, the leading country in the manufacture of cotton goods, and the inventions of the spinning-jenny and the power-loom, and the modification of the steam engine, so that it would furnish power for operating these machines, enabled England to manufacture a much larger quantity of cotton goods than ever before. When the American colonies had obtained their independence, there was a greater demand for cotton by the English manufacturers than the world was able to supply. This was not so much because a sufficient quantity of cotton could not be raised, as it was on account of the labor required to separate the fiber from the seed.

At this time the invention of the cotton-gin by Eli Whitney, an American, removed this great obstacle to the cotton industry. By the use of this machine, one man in a few hours could separate more cotton from the seed than a hundred men could in working by hand for the entire day. Probably no other invention has ever produced a more marked effect upon the industry and history of a country, than did the cotton-gin upon the United States. As soon as the raising of cotton was made profitable, large plantations sprang up all through the Southern States, and it was from the product of these plantations that the market of England was supplied.

#### **THE COTTON PLANT**

The cotton plant belongs to the mallow family, and is closely allied to the marsh mallow and the hollyhock. Originally it was a tropical plant, but its cultivation has now been extended to the fortieth parallel



of latitude on each side of the equator. However, it will not thrive where the mean annual temperature is not over sixty degrees. The cotton plant grows best in a sandy loam containing large amounts of lime and phosphate. The soil of the Southern States is composed largely of disintegrated limestone that contained these



NEGRO CABIN IN A COTTON FIELD

substances, therefore it is especially suited to growing the plant. Cotton needs a rainfall of not less than forty inches, and so distributed as to leave a gradually drying season in which to mature.

There are many varieties of cotton, but those grown in the United States are the short staple, which is the plant having a short fiber, and the long staple, more generally known as the "sea



island," which has a long fiber. This variety was so named because its cultivation was begun on the islands along the coast of South Carolina and Georgia, where most of the long staple is still produced. The fiber is about two inches in length and very fine and strong, making this the most valuable cotton grown. The short staple is by far the most extensive crop and it is this variety that fixes the market quotations. Because it is raised farther inland, it is generally known as "upland cotton."

The cotton plant is one of unusual beauty. The "upland" variety attains a height of about two feet, while the "sea island" plants are from eight to ten feet high. The leaves are dark green with blue veins. The plant has a showy white flower which resembles a single hollyhock. The fruit, in which the seed matures, is a round pod called the boll. When the seed is ripe the bolls burst and the white fiber appears. The useful part of the plant is the fine fiber or wool which surrounds the seed.

### **THE COTTON BELT**

What is known as the cotton belt of the United States includes Mississippi, Georgia, Texas, Alabama, Arkansas, Louisiana, South Carolina, North Carolina, and Tennessee. Cotton is also raised in Missouri, Virginia, Kentucky, Oklahoma, Arizona, New Mexico, and California. In these states the agricultural conditions are such as to make the cultivation of cotton successful and profitable. In most of them, previous to the Civil War, the cotton was grown on large plantations owned by slaveholders, many of whom had become very wealthy. The war destroyed these plantations, and most of the cotton is now raised on small farms, and in the Southern States the work is done almost entirely by the colored people.

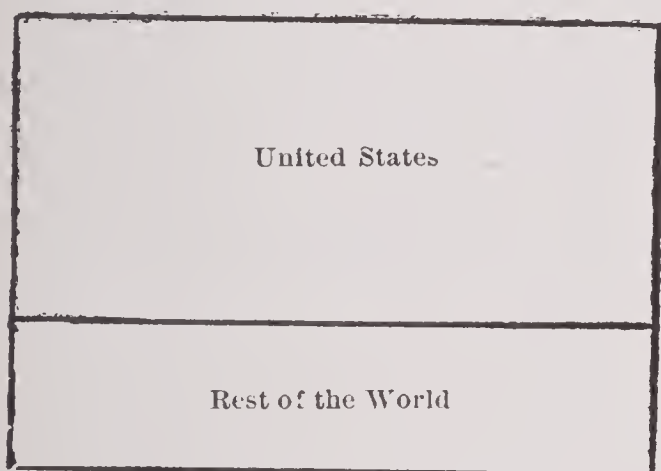
### **Cultivation**

The seed is sown the last of March or early in April. During the first part of their growth the plants must be carefully tended and kept free from weeds. The bolls begin to ripen about the first of September. As the bolls



burst they must be picked or the cotton is injured or wasted. Nearly all the work of the fields is performed by hand labor.

**Harvesting** Several machines for picking cotton have been invented, but none has proved very satisfactory, since during the early part of the harvest the plants contain both the ripened and the growing bolls. As the bolls have to be picked as fast as they burst, the pickers are obliged to go over the field again and again, until the last bolls have ripened. No machine has yet been invented which will pick the ripened bolls and leave



COTTON

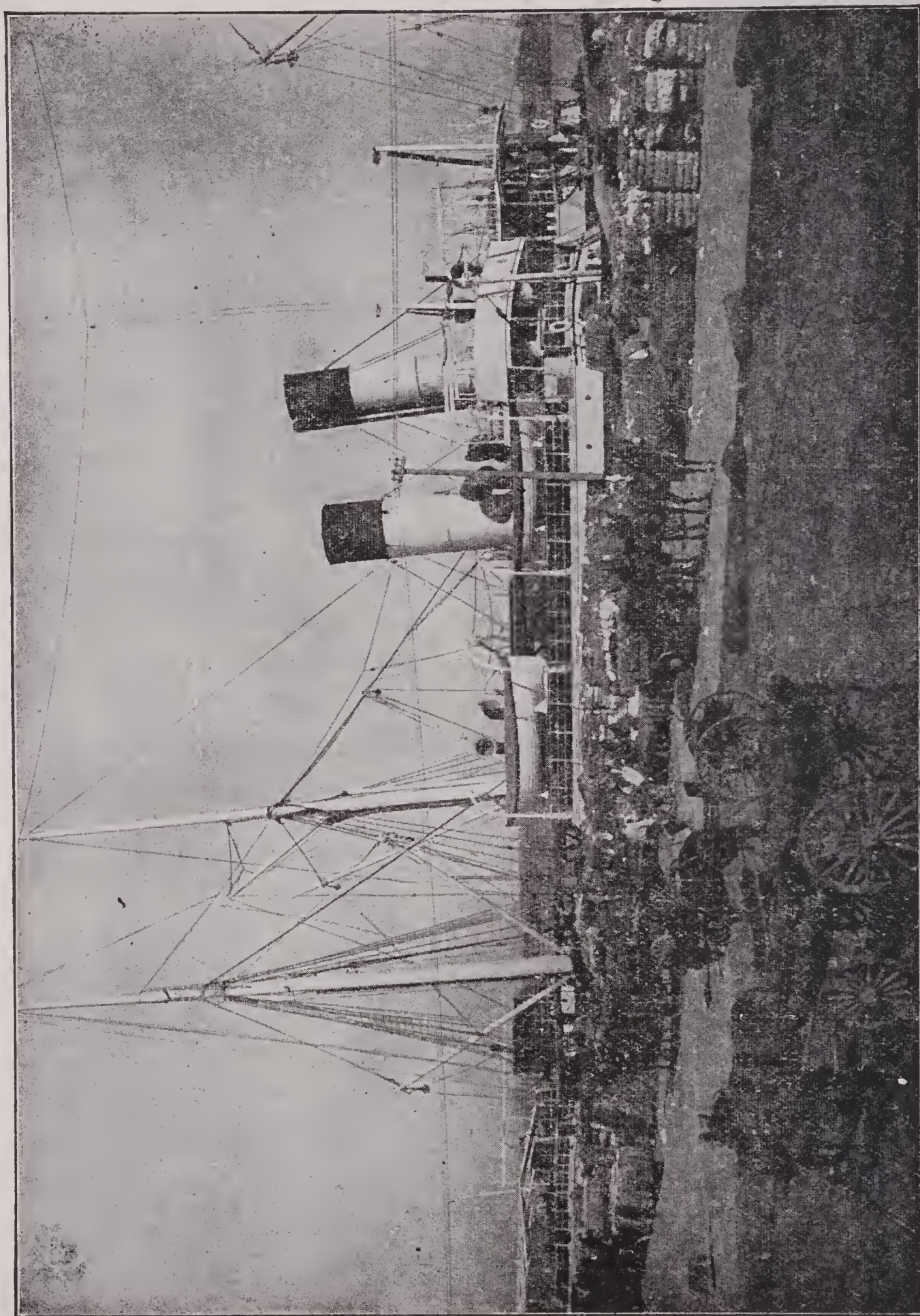
the others, consequently cotton must be picked by hand. As soon as picked, the cotton is hauled to the gin-house where it is ginned, that is, separated from the seed. From the gin it goes to the press, where it is made into bales. Each bale is intended to weigh 500 pounds, and the average weight is

about 480 pounds. Presses for baling cotton are very powerful, and in order that the bale may retain its form it is strongly hooped before the press is released.

**Marketing** The bales are usually sent to the nearest market towns, where brokers buy the cotton on commission for the agents of the large cotton mills, or for export. That for export is sent to the seaports, and from September to January the wharves of those cities from which it is shipped are crowded with bales of cotton. Galveston, New Orleans, Savannah, and New York are the principal ports of shipment.

Liverpool and Manchester are the greatest European cotton markets, and buy fully one-half the quantity exported from the United States. Bremen, Trieste and Genoa are also good markets.



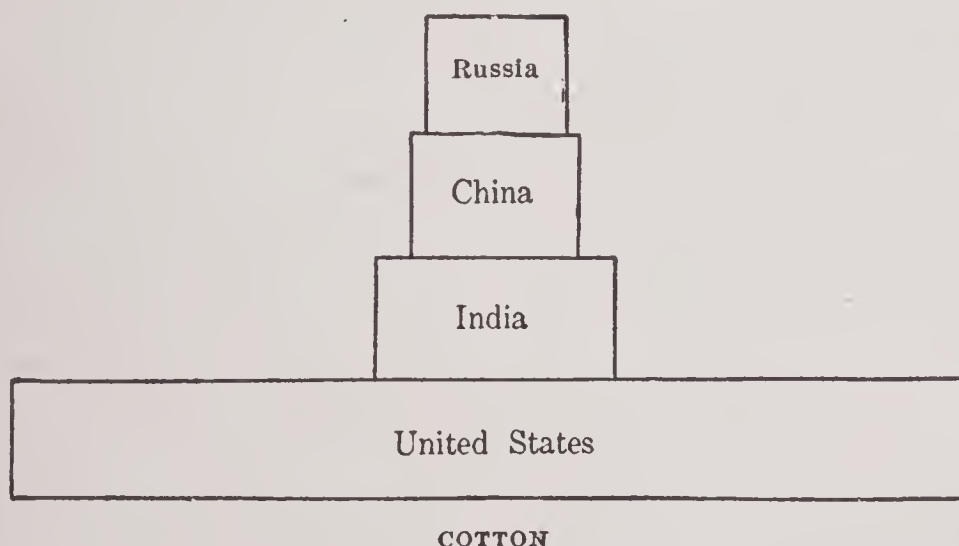


SHIPPING COTTON



About one-third of the crop is consumed in the United States. The mills in which this is manufactured are in the New England and some of the Southern States.

**VALUE** Of the four great staples — cotton, wool, flax, and silk — that supply man with clothing, cotton, on account of its cheapness and its many excellent qualities, is much more extensively used than any of the others. Cotton leads all farm crops in cheapness and ease of production, it makes scarcely any drain on the soil, and it is grown and harvested with the expenditure of less labor than most other crops. While the greatest value is in the fiber, the seed is a source of considerable profit. Cotton seed is valuable for the manufacture of oil, and after the extraction of the oil it makes an excellent feed for cattle and a valuable fertilizer as well.



The United States produces about five-eighths of the world's supply of cotton, but there is a great variation of the crop from year to year. In 1914, the crop amounted to 16,135,000 bales, in 1920, it was 12,028,732 bales, which is about the average crop. Prices fluctuate with the demand. During the war the prices became almost prohibitive, but the price of raw cotton in 1921 was about one-fifth higher than in 1912. Cotton is now marketed through an association.

The importance of the American cotton crop to the countries of Europe can scarcely be estimated. During the Civil War little or no cotton was exported and the operatives in the English cotton mills were brought to the verge of extreme poverty by being thrown out of work for most of the time that the war was in progress. In addition to the cotton consumed in the manufacture of textiles large quantities of short fiber known as "linters" are used in the manufacture of gun cotton and other explosives, and since 1914 the demand for this grade of cotton by the countries engaged in war has exceeded the supply.

Flax and silk are not produced in the United States in sufficient quantity to warrant their consideration in connection with the other textile fibers.

**OTHER CROPS** Other important crops are oats, in the production of which Iowa leads, followed by Illinois and Minnesota; barley, raised in largest quantities in North Dakota, Minnesota, California, South Dakota, and Wisconsin; hay, in which New York and Iowa lead; rice, raised chiefly in Louisiana, Texas, Arkansas, California, and in smaller quantities in several other states. Louisiana and Texas lead in the production of sugar cane, and Colorado, California, Michigan, and Utah in raising sugar beets.

## QUESTIONS.

From what part of the plant is the fiber of cotton obtained? The fiber of flax?

Why is more cotton raised in the Southern States than in any other part of the world?

What inventions have aided in the development of the cotton industry?

Why is England the leading country in the manufacture of cotton goods?

For what other purposes than the manufacture of cloth is cotton used?

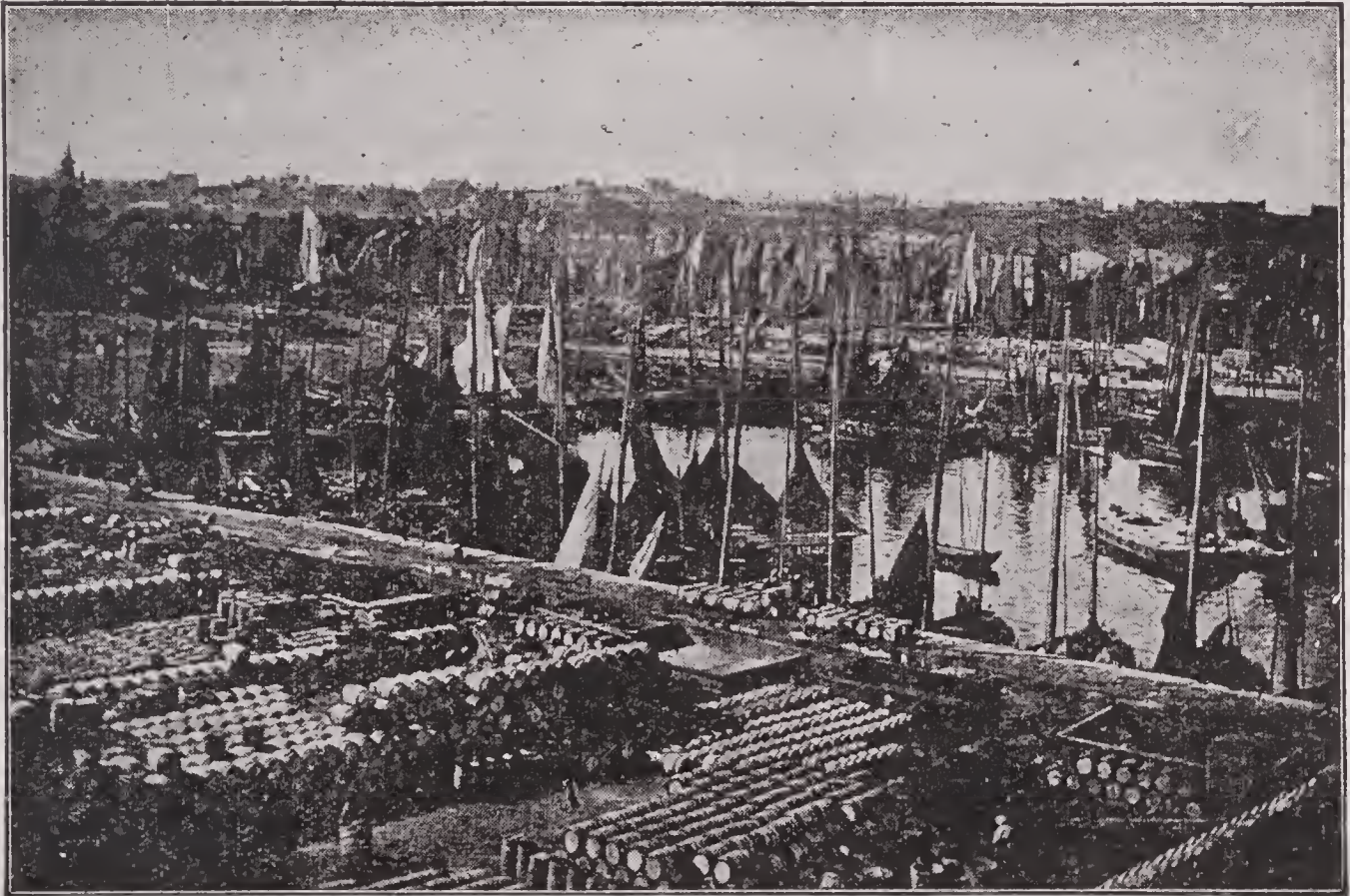


## CHAPTER VI

### FISHERIES

#### A VALUABLE FOOD PRODUCT

Fish have always constituted a valuable article of food. Long before man had learned to domesticate animals he relied upon fish as a means of sustenance, and savage and partially civilized peoples still make fish



A FISHING PORT IN HERRING SEASON

one of their chief articles of diet. Among civilized nations, taking and curing fish has, for centuries, constituted profitable employment and it has often been the means of adding largely to a country's prosperity.

Fish are found in both salt and fresh water, but the salt-water fish far exceed in quantity and value those found in fresh water. The best varieties of fish are found in cold water, salt or fresh, therefore most of our best food fish are found in the waters of the cool temperate regions.

**Salt Water Fish** The great fishing grounds of North America in the Atlantic Ocean extend from Cape Hatteras to Newfoundland, the most important being on the Grand Banks, lying east of Nova Scotia, Newfoundland, and adjacent islands. That part of these banks within three miles of the shore belongs to Canada, but a much larger portion is situated in the high seas and is open to fishermen of all nations. In both quantity and value, cod are the most important fish taken in these waters, and it is from the Grand Banks that most of the codfish that supply the markets of the United States are obtained. Codfish are cured by salting and exposing them to the air and sun to dry. Shredded or boneless cod is prepared by removing the bones and cutting the flesh into small strips. It is placed on the market in small packages weighing from one to five pounds. Gloucester, Mass., is the most important fishing port on the Atlantic coast, and it is the center of the cod-fishing industry; but the inhabitants of nearly all the coast towns of Maine, New Hampshire and Massachusetts are, to some extent engaged in fishing.

Haddock, herring and mackerel are also taken in large quantities. The halibut is a large fish, often weighing from 100 to 300 pounds. It is usually placed on the market without salting. Shad inhabit warmer waters than the cod and herring, and, at certain seasons of the year they are taken in large numbers at the mouths of all rivers as far south as the Delaware. The shad is a fish of excellent flavor and it is highly prized. Menhaden are not used, as food, but they are taken in large numbers because they are valuable for oil. The refuse, after the oil is extracted, is used in the manufacture of fertilizer.



The coast waters of the Pacific Ocean contain a number of the same species of fish that are found in the Atlantic, but the cod is not present. The tuna, often called "the chicken of the sea" because of its delicate flavor, is taken and canned in large quantities off the coast of Southern California. The salmon fisheries are by far the most important on the Pacific coast. They are located at the mouth of the Columbia River and Kadiak Island, Alaska, where we find the largest salmon fisheries in the world. The fish are caught by nets, traps and wheels, which throw them from the water as they crowd together in the rivers. The fish are dressed, packed in cans and cooked by steam. The cans are then sealed, labeled and packed in cases. Over 10,000,000 cases of salmon are packed yearly in those fisheries, and the total value of the output exceeds \$30,000,000.

### **Fresh Water Fish**

The Great Lakes embrace the largest inland fisheries in the world. Many tons of whitefish, lake trout and sturgeon are taken from these lakes every year. Most of these fish are placed on the market fresh, and by making use of the present means of refrigeration, they can be shipped to distant markets without loss or deterioration. Small lakes, rivers and creeks furnish catfish, trout, pickerel, bass and other excellent varieties, but not in sufficient quantities to make them commercially important.

### **GOVERNMENT CONTROL**

For many years fish were taken with so little care and forethought, that finally the best species became nearly extinct. The government now has oversight of the fisheries in all waters under its control, and through the United States fish commission makes rules prohibiting the taking of fish at certain seasons of the year, and also prescribing methods of fishing. The commission maintains fish hatcheries at various localities, where millions of fish are hatched every year. These, or eggs, are transported from the hatcheries in specially constructed cars, and placed in the waters of lakes and rivers,

wherever they are most needed. In addition to the United States fish commission, nearly every state now has its own commission and maintains its own hatcheries. Most states have already passed stringent laws regarding the catching of fish. By these means, the supply of fish is not only maintained, but in some localities it is even on the increase.

### QUESTIONS

What salt-water fish do you find in your market? Which variety is the most valuable?

Where are the great salmon fisheries? How are salmon preserved for the market?

Are there any valuable fishing grounds in tropical waters? If so, locate them.



## CHAPTER VII

### FOREST PRODUCTS

#### FOREST REGIONS


Forests are usually found in regions having sandy and loamy soils, and an abundant rainfall. They are seldom found where the rainfall is less than thirty inches and in the United States the most dense forests occur in regions having over fifty inches. Mountains within these regions are usually forest clad to their summits, unless, as in the Rocky and Sierra Nevadas, the altitude extends above the tree line.

The forest regions of the United States are located in the eastern and western portions of the country, and are separated by a vast treeless plain. The eastern region coincides with the Appalachian Highlands, and extends from Maine to Georgia and Alabama. The portion of this region south of the Ohio and Missouri extends westward across the Mississippi, so that the southern portion of Missouri, all of Arkansas, a good part of Mississippi, Louisiana, and Alabama are quite heavily timbered. A lighter growth also extends northward into Southeastern Iowa, and westward to include a portion of Kansas, a large portion of Oklahoma, and the eastern third of Texas, as far south as the thirtieth parallel. Pine, oak, and cypress are the prevailing trees in the southern portion of this region.


The northern portion of the Appalachian region contains white pine, spruce, hemlock, balsam, and many varieties of hardwood, such as maple, birch, and beech. The timber is heaviest in Northern Maine, Northern Vermont, and New Hampshire, and in the Adirondack region in New York. Passing southward the forest is most dense in Western Pennsylvania and along the moun-



# LUMBER

 Largest production

Important

 Small



tains through Virginia, West Virginia, North Carolina and Eastern Kentucky and Tennessee, and extending into the northern part of Georgia and Alabama. An abundance of pitch pine is found in this locality, and furnishes the source from which most of our turpentine, resin and tar are obtained. Lighter growths on the eastern slope descend to the coastal plain throughout the entire region, and on the western slope they extend across Ohio, the southern half of Indiana, the entire portion of Kentucky, and the southern part of Illinois.

The extensive white pine forests that formerly existed around the Great Lakes in the northern parts of Michigan, Wisconsin and Minnesota have in many places been almost entirely cut off. For nearly a half century this was the great lumber region of the country, and while the white pine is nearly exhausted, spruce, balsam, oak and hemlock are found in such quantities as to make the lumber industry important still. Trees too small for lumber are used in the manufacture of wood pulp, and those too small for wood pulp are used in making wood alcohol.

The forest regions of the Rocky Mountain Highlands extend southward along two lines. The first follows the eastern range of the Rocky Mountains into New Mexico. In the north this region covers the northern portion of Idaho, the western third of Montana, and the northwestern portion of Wyoming. South of this point it is much narrower, and is quite closely confined to the mountain range. The timber is mostly pine. The trees are tall, straight and of small diameter.

The coast division extends from the northern boundary southward into the northern part of California where it divides into two branches. The eastern, which is quite narrow, follows the Sierras as far as the thirty-fifth parallel, and the western follows the coast almost to the Golden Gate. The northern portion includes Washington, west of the Columbia River, and the western third

of Oregon. Here is the most dense forest in the United States. Here are found the Oregon pine, sugar pine and the redwood. The trees in this forest are much larger than those around the Great Lakes and along the Appalachian Highlands, and the most extensive lumbering interests are now located in this portion of Washington and Oregon.

#### USE OF FORESTS

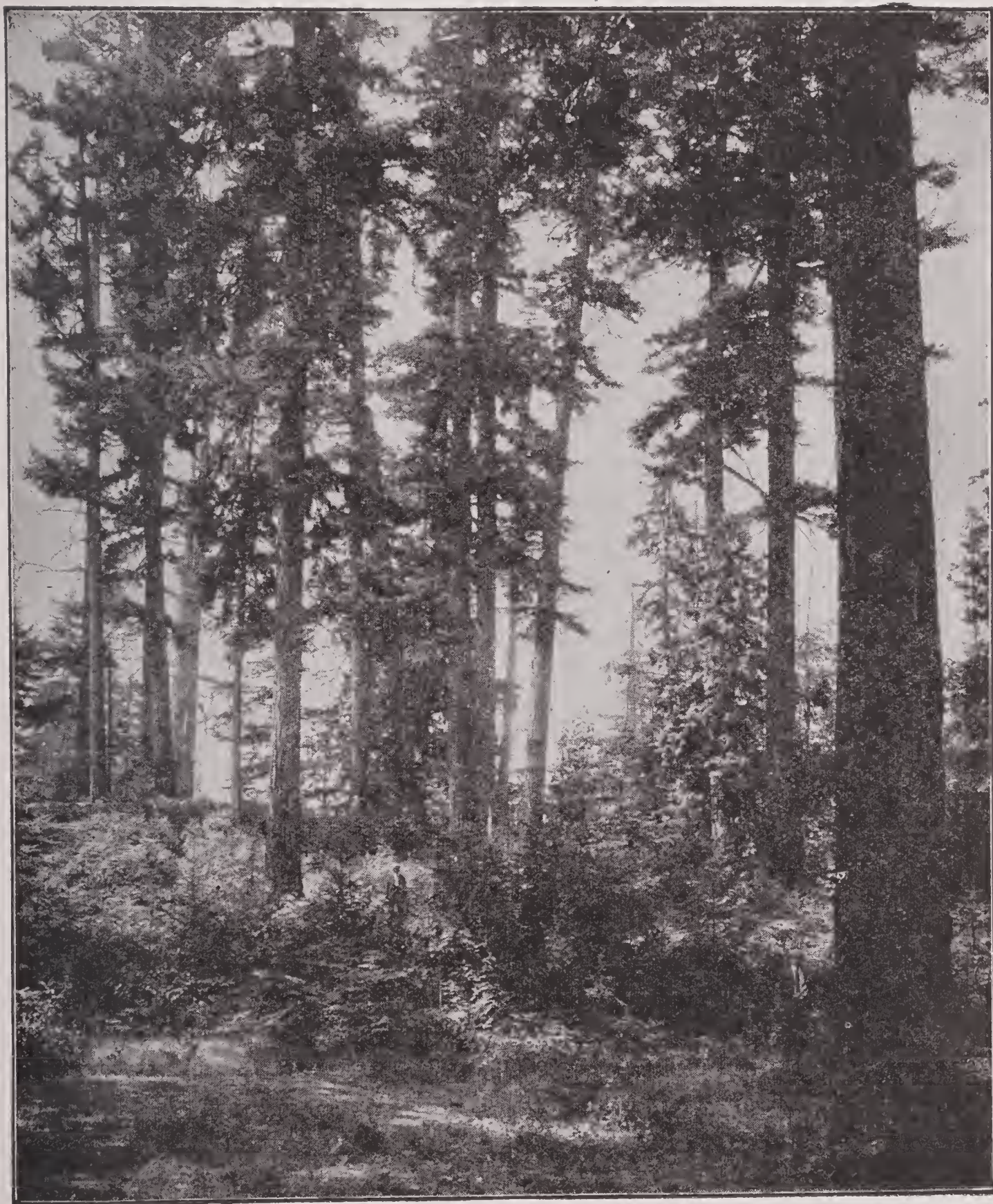
The greatest use of forests is for lumber, and some kinds of trees are more valuable for this purpose than others. These are divided into hard wood and soft wood. The most valuable of the soft wood trees, in their order, are white pine, yellow or pitch pine, spruce and hemlock, in the Atlantic division; and the red cedar, or redwood, and Oregon pine, in the Pacific division. Of the hard woods, oak, hickory, maple, poplar and ash are the most extensively used. Soft woods are more generally used for making the frames and finishing interiors of buildings, while hard woods are used for finishing interiors, the manufacture of furniture, the framework of carriages and machinery, and for many small articles in common use.

White pine is the most valuable timber tree of the temperate regions, and was more extensively used than any other. This tree was formerly found in large quantities from Maine to the Mississippi River, and its abundance in Michigan, Wisconsin and Minnesota gave rise to the large lumber industry carried on in those states. These same states still have a thriving business in hard wood lumber.

Pitch pine, or yellow pine, is found in the southern part of the Appalachian Highland region, and is cut quite extensively in North Carolina and Georgia and is known in the market as Georgia pine. The cypress, another soft wood tree, is also used to some extent in the Southern States.

The forests of the Pacific States differ from those of the





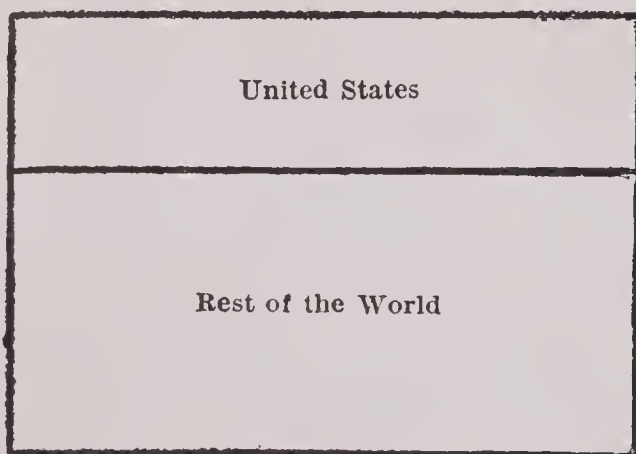
A GROVE OF REDWOODS, OREGON



Atlantic States by having much larger trees, and a much more dense growth. The abundant moisture of this region causes the redwood and the Oregon pine to grow to a gigantic size. Trees measuring four or six feet in diameter are of common occurrence in these forests, while the large ones often attain a diameter of sixteen feet or more, and are nearly four hundred feet in height. The Oregon pine or Douglas fir, as it is frequently called, is the tree most generally used for lumber. The redwood is also valuable.

### USES

The uses of wood are so extensive and numerous, that it would be impossible to name them all. More people live in houses built of wood than in those built of brick and stone. Wood is used as a fuel more extensively than coal. In some form



or other it touches our daily life on every hand. Besides forming the framework and finishings of our dwellings and places of business, from it are made those small articles which are indispensable, yet so common that we do not realize their importance until deprived of their use. In the form of wood pulp, it constitutes a

good portion of all the paper now manufactured, and as papier-maché, it becomes the material from which are made tubs, pails, and numerous other domestic utensils.

Lumbering ranks fourth among the great manufacturing industries of the country. The yearly output of sawed lumber is valued at about \$700,000,000, and the industry gives employment to about 700,000 men. Lumbering centers move from one region to another as the timber is exhausted, and the great demand for lumber is rapidly depleting the forests.



**OTHER  
PRODUCTS**

Besides wood and lumber, our forests yield us several other products of importance. From the pitch pine of the South we get tar, turpentine and resin. The tar is a thick, black liquid, which is obtained by partially distilling the pitch pine. It is used for caulking the seams on ships, covering roofs to make them water-tight, and in the manufacture of some kinds of rope. Coal tar is now extensively used for these purposes, so that the demand for pitch tar has been greatly lessened.

Turpentine is procured by distilling the sap of the pine. It is used in the manufacture of varnish and in the preparation of paint. Resin is the residue obtained after the turpentine has been driven off by distillation. It is used in the manufacture of laundry soap, as a reducing agent in soldering, in making varnish, and for some other minor purposes.

The bark of the hemlock and the oak is extensively used in tanning leather.

**VALUE OF  
FORESTS**

However valuable forests may be as the source of lumber and other products, they are of still greater value on account of their place in the economy of nature. Forests are the great conservators of moisture, and their influence upon the water supply of the country is much more extended than we often think. The ultimate sources of all important streams are in heavily timbered regions. The great areas of rootage and leafage formed by these forests are the principal agents in regulating and increasing the amount of moisture in the atmosphere.

The roots of trees are constantly drawing water from the soil, which, after it circulates through the plant, is given off by the leaves in the form of vapor. At first thought it would seem that the amount of moisture thus given to the atmosphere would be extremely small, but the best authorities tell us that a medium-





A LARGE LUMBER MILL ON THE PACIFIC COAST



sized elm contains about 7,000,000 leaves which present to the air a surface of about five acres, and that these leaves will give off about seven and three-quarters tons of water in twelve hours of clear, dry weather. When we multiply this by hundreds and thousands to represent the trees in a large forest we soon discover that the amount of water thus discharged into the atmosphere is beyond our comprehension.

The soil of the forest has been made porous by the numerous roots that permeate it, so that it absorbs the water from heavy rainfalls or melting snows, and easily retains it, allowing it to flow out gradually through the springs and small streams. When an area has been denuded of its forest trees, instead of absorbing the water from the heavy rainfalls, the soil allows it to run off, and we find that streams flowing from these regions suddenly become flooded and often do great damage.

**FORESTRY** The greatest dangers to our forests are from their ruthless destruction by lumber men, and from forest fires, which destroy thousands of acres every year. It is only within a few years that the Government has realized the importance of preserving the forests around the sources of our great rivers, and has taken such measures as will prevent their destruction. The Department of Agriculture now has a Bureau of Forestry. The duties of this bureau are to prevent the cutting of timber from government lands, to prevent forest fires, and to instruct those, who so desire, in the care of forests and the growth of trees. Some of our leading colleges, also, now give courses in forestry, and our public schools observe Arbor Day throughout the country, the purpose being to interest the pupils in the planting and growth of trees. In the western half of the United States forest reserves have now been established around the head waters of the Mississippi, Missouri, Yellowstone, and some other important rivers. Some of these, particularly Yellowstone Park,

Yosemite, Glacier National Park, and Rocky Mountain Park, have been made national parks. The United States is gradually assuming that care of her forests, which for many years has been exercised by the Germans over the forests of their country, and if this is continued there is no reason why trees should not grow as fast as they are used, and our forests be maintained for years to come.

### QUESTIONS

How many different trees can you recognize? Name them.

Why are forests more generally found in mountainous regions than on plains?

What benefits do forests confer upon the country besides furnishing lumber and fuel?

What measures does the Government take to protect forests?

Where are the great lumber markets located? Why?

Why is white pine so extensively used for lumber? Name some of the uses for which hard-wood lumber is employed.



## CHAPTER VIII

### MINERAL INDUSTRIES

Buried beneath its surface, the earth contains untold treasures. Some, like precious stones, are valuable because they are rare and beautiful; others, such as gold and silver, because of their peculiar relation to commerce and industries; while still others, such as iron, copper and coal, because their general usefulness has given them important economic relations. These common minerals are so closely associated with all lines of industry that they have become indispensable.

**MINING** Mining is the occupation of extracting minerals from the earth, and sometimes the process of separating metals from their ores is so closely associated with it, that both operations are considered together. This is particularly true of those mines having smelting works near at hand, and whose ores contain a number of metals, such as gold, silver and copper.

**Location of Mines** Minerals are most abundant in the mountainous regions, and, as already noted, we find the important mining states to be those of the Appalachian and Rocky Mountain Highland regions. To this we must make one noted exception. The great coal-producing states of Ohio, Indiana and Illinois are located in the prairie region, and their coal measures seem to lie as they were first formed, without having undergone any change of position by such movements of the earth's crust as formed the great mountain ranges.

**Methods** All mining is prosecuted in very much the same way. When the material to be obtained is deep in the ground, shafts are sunk, and, from the foot of these, galleries are

excavated. The galleries follow the vein of mineral and are often very irregular and winding. The surrounding rock is kept from caving in by timbers which are put in place as the excavation proceeds. The ore is hoisted to the surface by elevators, operated by hoisting engines, or it is taken out by tram cars. Every mine is provided with ventilating shafts and with pumps for carrying off the water that is constantly running down.

In many mines among the Rocky Mountains and in the coal regions of Pennsylvania shafts are sunk to a great depth, and several galleries, called levels, are excavated, one above the other, the ore from all being brought to the surface from the same shaft. The aim, in all cases, is to secure the mineral with the least possible expense consistent with safety to the miners.

When the ore, or metal, occurs on the surface, as in case of gold in the sand and gravel on the beach or along the bed of a stream, mining is a very simple process. The gravel is shovelled into a pan, or sluice, and washed. The gold is heavier than the pebbles and sinks to the bottom more quickly. When the washing is in a sluiceway, slats are nailed across the bottom of the sluice every few feet. The water is turned on and the gravel shovelled in at the upper end. As the gold sinks, the slats keep it from running down the sluice, and, when the water is shut off, it is picked out. The great iron mines around the upper end of Lake Superior are also surface mines. But these are described on page 123.

**Mining Towns** Towns usually spring up around the mines.

They comprise the dwellings of the miners and officers, a few stores, possibly one or two banks and hotels, and one or more places of amusement, with other public buildings. Most of these towns are of a temporary nature, and disappear when the mine becomes exhausted, and the miners remove to another locality. For this reason the buildings are usually plain





THE DOUBLE HOIST AT THE BUTTE MINES, MONTANA

board structures of the simplest sort. They may be comfortable and reasonably convenient, but they are not ornamental.

**Importance** The mining industry is closely related to transportation and manufactures. The carrying of ore, coal and stone constitutes the larger part of the business of those lines of railway which traverse the mining regions, and the product of the mines constitutes the fuel and raw material necessary to a number of lines of manufacture. In addition to this, the products of the mills that work up this raw material are necessary to other factories engaged in the production of entirely different lines of goods. The lumber of the sawmills enters into the manufacture of furniture, the construction of houses, and the making of many domestic utensils. Iron enters into the construction of all machinery, and without machinery many of the products of the present day would be impossible.

The mountainous regions, though rugged and barren on the surface, are valuable, for without the minerals which they contain, much of the business of the world, as now carried on, would be wholly impossible.

All minerals can be divided into two great classes—metals and non-metals. Gold, silver, iron, copper and lead are examples of our most common metals. Coal, marble, granite, sand and salt are examples of non-metals. This class is much larger than the metals, and many substances found in it differ widely from each other in appearance and properties.

### QUESTIONS.

Are any important minerals found in your locality? If so, for what are they used?

What is an ore? What ores can you tell by their appearance?

Why are mining towns usually so poorly built?

How many metals can you recognize? Name them.

How many different kinds of rock can you recognize? What is the difference between a rock and a metal?



## CHAPTER IX

### METALS

#### CHARACTERISTICS

In general, metals have a bright lustre, are hard, and are good conductors of heat; that is, they heat and cool quickly. They are also good conductors of electricity, and, with the exception of mercury, are solid at ordinary temperatures, but melt when heated to a high temperature. Many metals in their pure state are mere curiosities and only a few of the entire series enter extensively into the world's industries and commerce. The most important of these are gold, silver, copper, zinc, lead, tin, mercury, aluminum, and iron.

#### ORES

Metals are found in a pure state scattered through veins of rocks, or combined with some substance in the form of rock. Gold and copper are good examples of metals occurring in the pure state in veins. Gold is usually found imbedded in veins of quartz, and copper may be in quartz or other rock. The veins fill crevices in the surrounding rock, which is of an entirely different sort. The veins are very irregular, may be from a few inches to several hundred feet in width, and frequently send off branches in various directions. The rock in the vein and surrounding the metal is usually known as gangue. Ore in the form of rock is more liable to occur in masses. Then the rock is quarried and treated to the process necessary for extracting the metal.

#### GOLD

Gold has been one of the longest known of the metals. It is widely distributed over the earth, and occurs free, that is, in a pure state. Wherever it occurs it is readily recognized by its color, and with few exceptions is easily obtained. The

ancients used gold for the purpose of ornaments, jewels, and utensils in their sacred temples. Then, as now, a high value was placed upon it.

**Production** The United States, South Africa, and Australia are the leading gold-producing countries of the world. The gold regions of the United States are confined to the Rocky Mountain Highlands, the Pacific Slope, and Alaska, where extensive placer, or surface, mines have been developed in Seward Peninsula and along the Yukon River. The aggregate production of gold in the world is some over \$365,000,000 a year. Of this amount the United States, including Alaska, produces about \$50,000,000, or more than one-seventh.

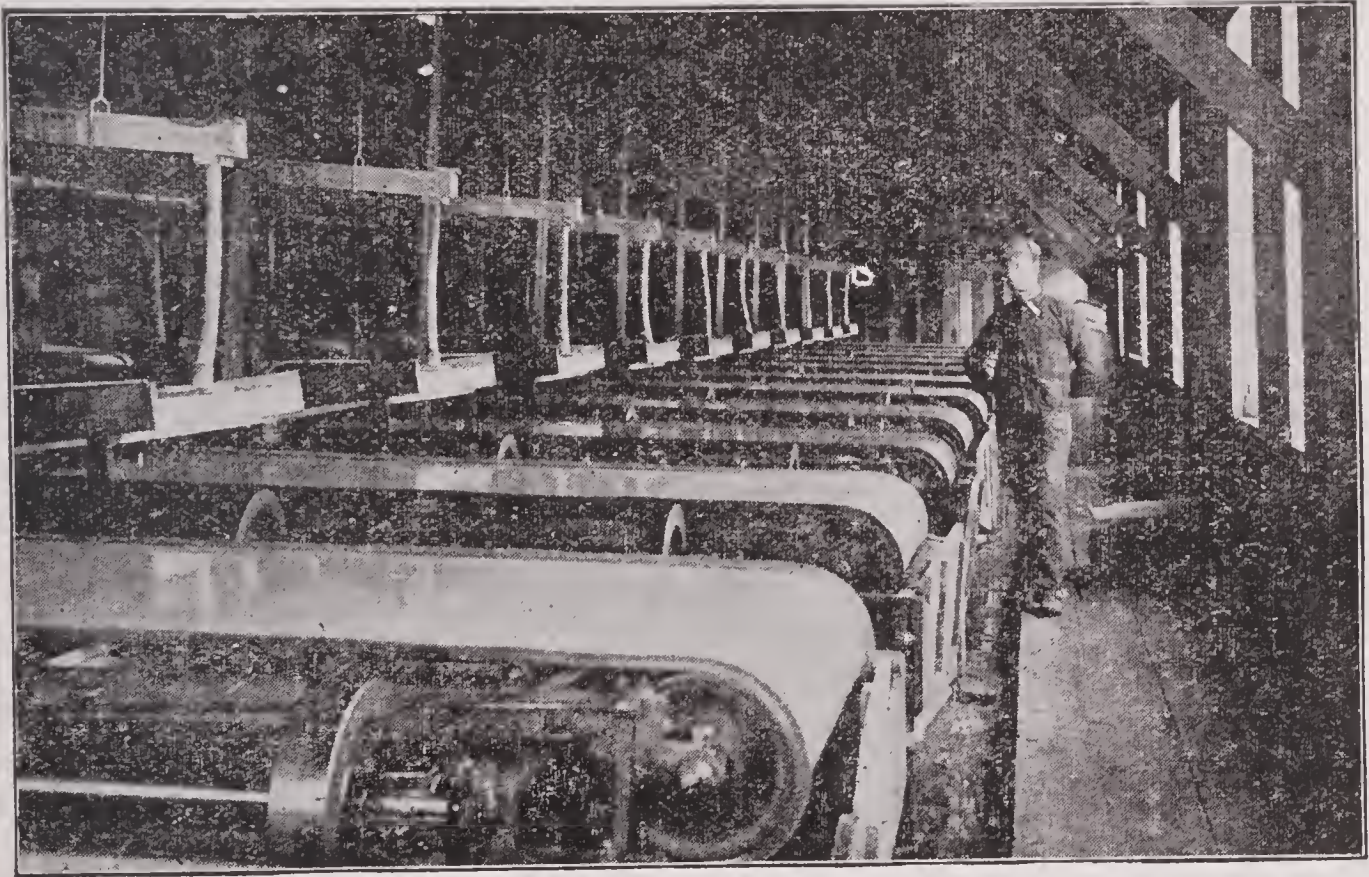
**Use** Gold is of great importance in commerce and in the arts. It will not tarnish and cannot be corroded by any substance but a mixture of muriatic and nitric acids, and is the only metal that can be used for some forms of gilding, and in the manufacture of the finest quality of jewelry and ornamental ware. On account of its steady value, it has become the standard for money in nearly all civilized nations. In the United States 25.8 grains of gold make a dollar, which gives the metal a value of \$20.639 a troy ounce. In practice, a small quantity of copper and silver are mixed with the gold to harden it, so as to prevent loss by the wearing away of the coin.

**SILVER** Silver has probably been known as long as gold. It is as widely distributed through the earth, and is even more abundant. Unlike gold, however, it is not found in a free state, but occurs combined with one or more substances in the form of ore. Most of the ore is a dark colored rock, in which we find the silver frequently combined with lead and copper, and it is from the reduction of ores of this sort that a large part of the silver produced in the United States is obtained. The processes are very complex, and consist in crushing the ore, washing it,



treating it with chemicals and smelting. Our annual production is about 73,000,000 ounces. The other leading silver-producing countries are Mexico, Canada, and Australasia.

Silver is used to some extent in coinage, but largely in the manufacture of silverware and plate. Several of its compounds are also employed in photography. Gold and silver are considered



CONCENTRATORS IN A GOLD MILL

Concentrators are tables having a vibratory motion, and when in use water is constantly running over them. They are used with ore containing gold or silver. The ore is crushed very fine, then the worthless parts are separated by running the crushed ore over the concentrator. The parts containing the metal are heavier than the others and settle while the running water washes the rock away.

as the commercial metals, for the values of all commodities are measured by them, and for centuries they have constituted the medium of exchange for the world.

## COPPER

Copper is one of the most useful metals in the arts, and, like gold and silver, was known to the ancients, who used some of its ores in the manufacture of bronze. It was

with tools of bronze that the Egyptians cut and fashioned the stones for their temples and monuments, and the possession of large mines of copper made them the leading commercial nation of their time. While copper is found in all parts of the world, it occurs in large quantities only in a few localities. The copper regions of the United States are along the south shore of Lake Superior, in and around Butte and Helena, Montana, in several localities in Arizona and in Alaska.

The mines in the Lake Superior regions are on the small peninsula known as Keweenaw Point, and are among the most interesting mines in the world. The copper in this region occurs as free metal, and is found in veins in rock. It is obtained by crushing the rock, then separating the metal by washing. These mines have been worked continuously since 1847, and some of them now extend over a mile below the surface and are the deepest in the world. The ore in the Montana and Arizona districts is in the form of a sulphide, from which the copper is obtained by roasting and then smelting.

Arizona and Montana are the leading states in the production of copper. The Montana ore is a dark slate-colored rock bearing no resemblance to copper. The ore is crushed to a fineness of powder, then washed in water flowing over vibrating tables, which separates the worthless portions from those containing the copper. The particles containing the metal are heavier than the others and settle, while the lighter and worthless portions are carried away by the water. The crushed ore is then roasted in large furnaces where it is brought to a red heat. This drives off the sulphur in the form of gas, and the roasted ore when smelted yields the copper. The gas driven off in roasting the ore destroys vegetation and scarcely a green thing can be seen in and about Butte or Anaconda, where the furnaces are located. The Arizona mines have not yet been fully developed, but they rank first in the United



States, in the order of production, the Lake Superior mines being third, and Alaska fourth.

The United States as a whole produces about one-half of the world's supply of copper, and the mines in the three regions named yield over two-thirds of this quantity. The exports of copper have increased rapidly since 1914, owing to the extraordinary demand for it by England, France, and Russia for the manufacture of munitions.

Copper is combined with zinc in the manufacture of brass, and with zinc and other metals for the making of various kinds of bronze. It is also used in sheets for making boilers, covering roofs, and sheathing the hulls of ships, [but by far the most extensive use is in the manufacture of copper wire which is largely employed in the construction and operation of electrical machinery.

**ZINC** Zinc occurs in ore commonly known as blende. The most valuable mines are located in the vicinity of Joplin, Missouri, and Platteville, Wisconsin. Other mines of some importance are found in Illinois, Indiana, and New Jersey. The amount of zinc produced in the country is not large, but in considering our mineral industries, this metal deserves a notice on account of its relation to other metals with which it is combined in so many ways as to make it an important article of commerce.

**LEAD** Lead is found more generally in the Rocky Mountain region and in the northwestern part of Illinois, where it occurs in a compound of lead and sulphur. As already stated, much of the lead ore, especially that in the Rocky Mountain region, is combined with silver and copper, so that on reduction the ore often yields the three metals. The most extensive uses of lead are for making lead pipe, and in the manufacture of a compound known as white lead, which forms the basis of our most valuable paints.

**MERCURY** About five-sevenths of the mercury produced in the United States comes from California. Mercury is about thirteen and a half times heavier than water and at ordinary temperatures is a liquid. These peculiarities make it valuable in the manufacture of thermometers and barometers. It readily dissolves gold, with which it forms an amalgam, and for this reason it is extensively employed in obtaining gold from ores in which the gold occurs in small quantities. It is also used in the manufacture of paint known as vermilion, and for silvering mirrors.

**ALUMINUM** Aluminum is found in all clay compounds, and exists in abundance, but as yet we have not been able to extract it from but a few of its ores. The richest of these is the mineral known as bauxite, from which the aluminum is obtained by a powerful electric current. It is only since the construction of the large dynamos at Niagara, that the production of aluminum for commercial purposes has been possible, and nearly all the supply for the world is produced by the Pittsburgh Reduction Company, which operates plants at Niagara Falls and Pittsburgh in the United States, and in England.

Aluminum is the most recent metal to come into general use. It is now employed in the construction of household utensils; it is taking the place of copper for wire in connection with electric machinery, and is used in place of stone in printing lithographs.

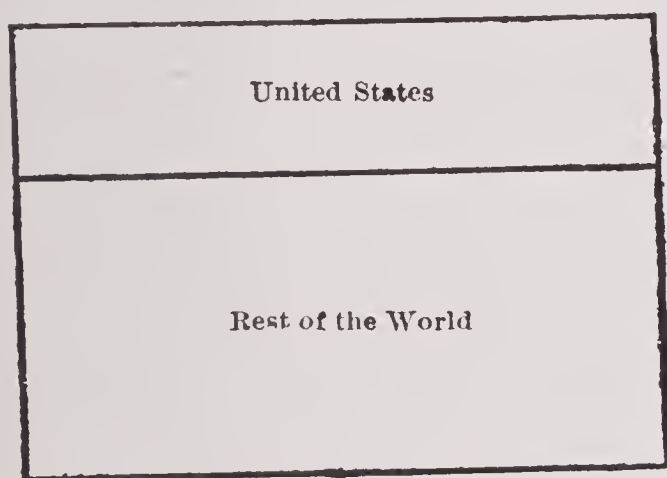
## IRON AND STEEL.

**IRON** Iron is the most useful and important of all the metals. It is distinctly the metal of civilization, and its extensive use characterizes the present as the Iron Age. On account of the difficulty in extracting iron from its ores, it was not known or used for several centuries after gold, silver, and copper were common. The Romans acquired the art of smelting the ore, and



used iron at first for coins, then for tools and weapons. Other nations followed the example of the Romans and improved upon their methods, and each century has seen the use of iron widely extended.

**Iron Ore** Iron is seldom found free in nature, but is extracted from its ore, which occurs in the form of rock, and is very generally distributed over the earth. Its occurrence in commercial quantities in or near those localities where fuel is abundant



IRON AND STEEL

is one of the principal factors in a nation's prosperity. Sometimes water percolating through rock containing iron dissolves a portion of the metal, and brings it to the surface, where it is occasionally deposited in bogs and marshes. These deposits look like large lumps of rusty iron, and are known as bog ore. It

was from this ore that iron was first made in the United States.

**Iron Regions** The important iron regions of the United States occur in the Appalachian Highlands, in the Rocky Mountain Highlands, along the shores of Lake Superior, and in the Ozark Mountains, in Missouri. Of these, the Rocky Mountain deposits and those in the Ozark Mountains have not yet been developed. The iron industry began in those portions of the country that were first settled, consequently the mines in the Appalachian Highlands have been worked for a long period, and in the northern portion of this region, among the Adirondack Mountains, some have become nearly exhausted.

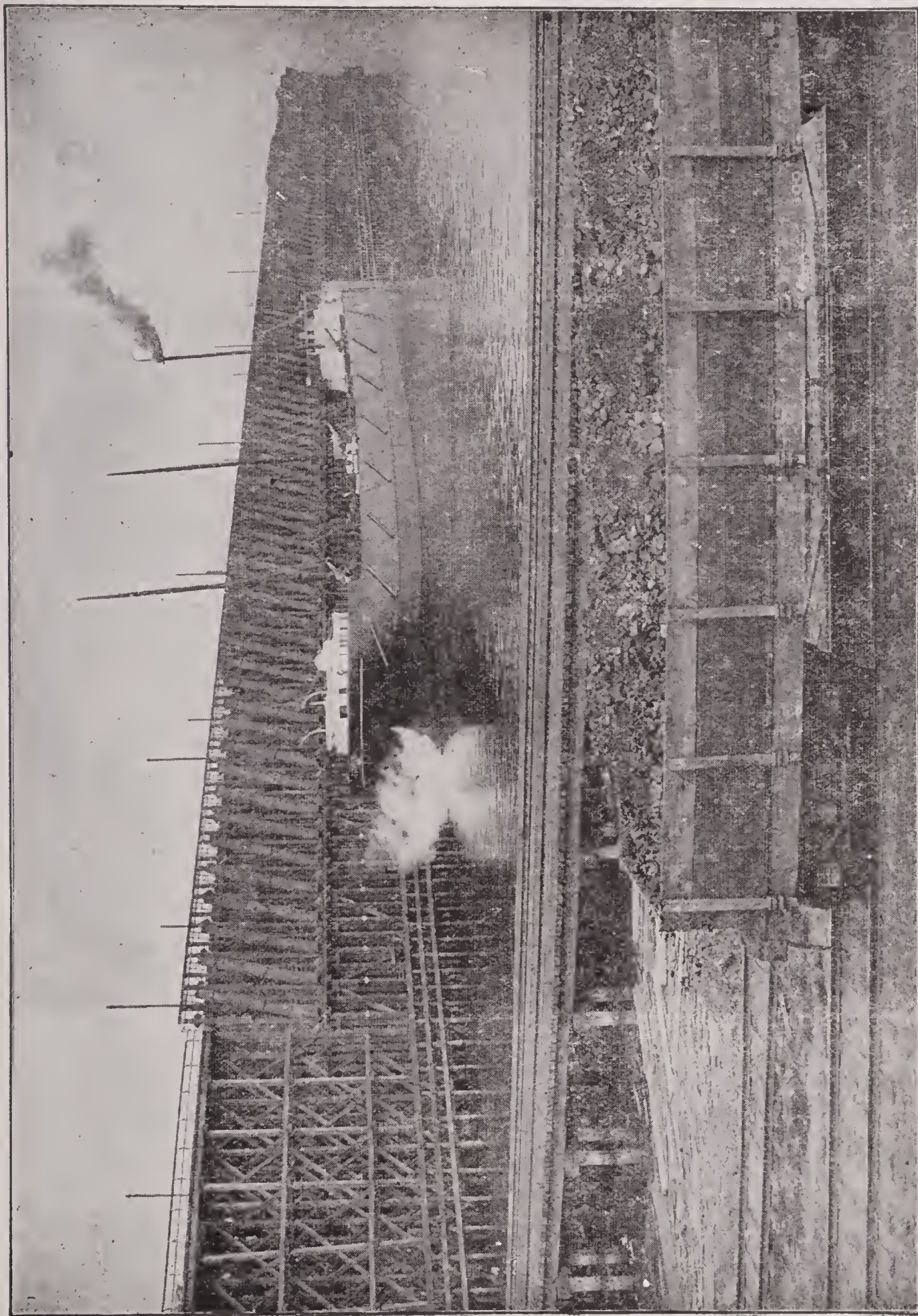
The most prolific sources of iron at the present time are in the Lake Superior region where large deposits of red hematite are found in the Mesaba Range in Minnesota and the Gogebic

Range in Michigan, just south of the lake. In both these regions the ore occurs in the form of decomposed rock or gravel, and is in such a state that it can be loaded on to the cars by the use of steam shovels. One of these shovels will scoop up several tons of ore at a time, and it requires but a few minutes to load the car. This ore is loaded on cars specially constructed for the purpose. These cars are then run upon elevated tracks at the ore docks, where they are unloaded by dumping the ore into chutes. These chutes are of sufficient height to allow the ore to slide from them into the holds of the ships, which transport it to the iron manufacturing centers on Lakes Erie and Michigan. So perfect is the arrangement of all these appliances that a large ship can be loaded with ore in from one to three hours, and smaller ships in less than an hour. The ore is so easily mined, and water transportation is so cheap, that the ore from this region is often delivered at Cleveland, Ohio, or Erie, Pennsylvania, at an expense not exceeding 85 cents per ton.

**Iron Mills** The great iron mills are located where the ore and the fuel required to smelt it can be the most cheaply brought together. These localities are in Western Pennsylvania, Southeastern Ohio, around the southern end of Lake Michigan, and near Birmingham, Alabama; consequently we find Cleveland, Ohio, Erie and Pittsburgh, Pennsylvania, Chicago, Illinois, Gary, Indiana, Birmingham and Bessemer, Alabama, to be our most important cities in the production of iron and steel.

Since it requires about two and one-third tons of coal to smelt a ton of ore, it is much cheaper to transport the ore into the locality where the fuel is obtained, and, in addition to this, the boats which take the ore from the Lake Superior region to the ports on the lower lakes can return laden with coal, so that with the transportation of both commodities the traffic for these lines of steamers is very profitable. Moreover, this method of transporta-





ORE DOCK, SHOWING THE METHOD OF LOADING VESSELS



tion enables the people of the West and the Northwest to obtain their coal at a much lower rate than they could if it were transported all the way from the mines by rail. Much of the coal used in Minnesota, Wisconsin and Michigan, is brought by boats to some lake port, and from there shipped to its destination.

**Uses** Iron is used in three forms; cast iron, wrought iron and steel. When the melted iron comes from the furnace, it is either run into steel molds or into channels in sand; in either case, it is cast into bars known as pig-iron. This is the crudest form of cast iron and is used directly in making articles, such as stoves, and some ordinary utensils where great strength is not required. These articles are cast by simply re-melting the iron and pouring it into the molds.

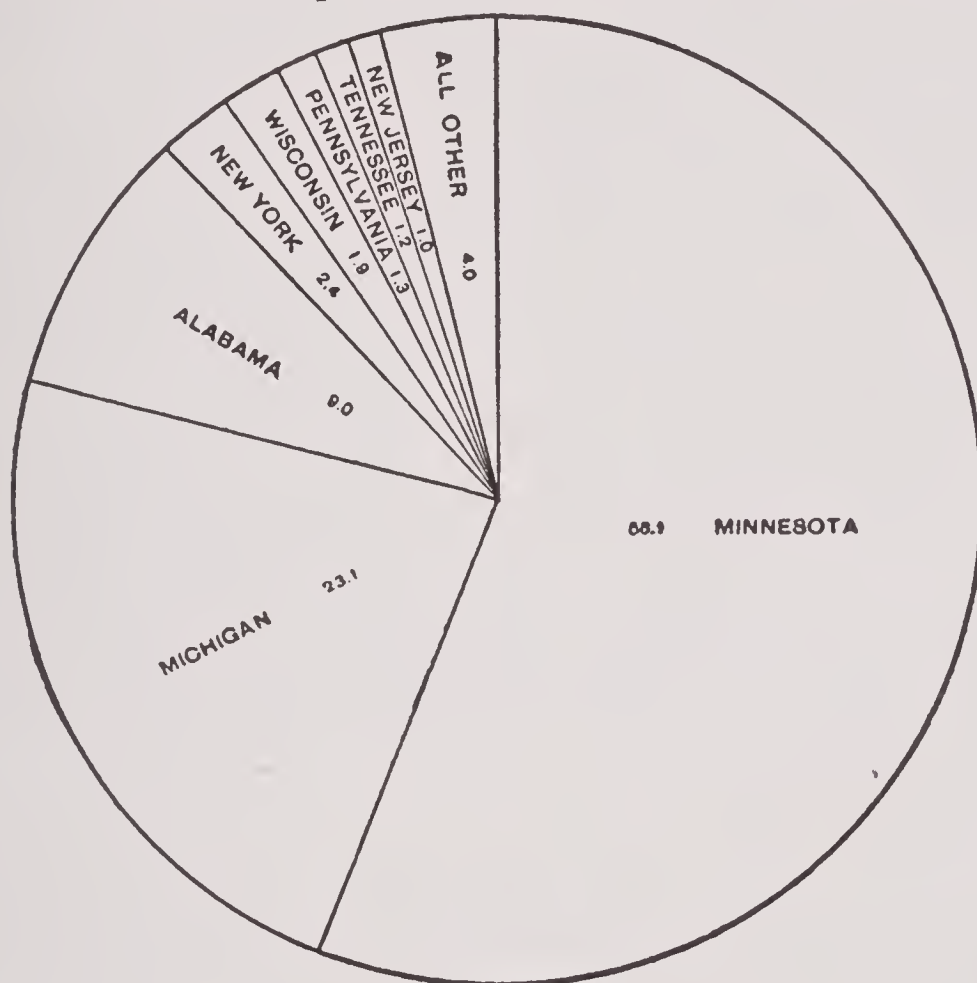
When pig iron is melted in a furnace in which it can be stirred or puddled, the quality of the iron is greatly improved. It loses its brittleness and can be rolled out into bars, or sheets, without difficulty, and can be bent without breaking. This product is called wrought iron, and is used in the manufacture of rods and many articles where toughness and strength are required, though the present method in the manufacture of steel has somewhat restricted its use, but it is still extensively employed in the manufacture of wire, the uses of which are constantly increasing.

**STEEL** Steel is a form of iron which contains a certain amount of carbon. This increases the hardness of the metal and also its strength. Steel is made by three methods. The old method is to pack bars of wrought iron in iron boxes with charcoal and keep them at a red heat for several days. This method is still used in the manufacture of steel of a very fine quality.

**Bessemer Steel** For many purposes for which steel is used, it is now manufactured by what is known as the Bessemer process, which takes its name from Sir Henry Bessemer, its discoverer. Cast iron contains too much



carbon, and wrought iron does not contain enough. By the old method of making steel the carbon was burned into the wrought iron. By the Bessemer process it is burned out of the cast iron.



PER CENT PRODUCTION OF IRON ORE, BY STATES

The Bessemer process of making steel was one of the most valuable discoveries of the nineteenth century. By this process the cost of manufacture was so reduced that steel became available for many purposes for which its expense had hitherto rendered it impracticable. The modern railway, with its ponderous locomotives and steel freight and passenger cars, became practicable. The employment of steel in shipbuilding made possible the great ocean liners now used in both freight and passenger traffic, and its use for frames of buildings led to the modern city skyscraper, often extending upward for twenty or more stories.

But, notwithstanding the position held by Bessemer steel for the

first quarter of a century after its discovery, it has been replaced for many purposes by what is known as open-hearth steel, so called because it is made by removing the impurities from molten iron by spreading it on the bottom or hearth of a furnace and exposing it to a flame of intense heat.

**PRODUCTION** The United States is the leading nation in the world in the production of iron and steel. She is followed by Great Britain, which, in turn, is followed by Germany. The iron industry is one of the most important in the country. While a large amount of the product is used at home, a great quantity of it is also exported to the countries of Europe, Asia, and Africa. These exports are not in the form of iron and steel as they come from the smelting furnace, but in manufactured products such as bridges, rails, and machinery. Minnesota and Michigan lead in the production of iron ore, while Pennsylvania, Ohio, and Illinois, in the order named, lead in the production of manufactured iron and steel.

## QUESTIONS

What is a vein of ore? Did you ever see a rock with veins in it? How can you tell them?

What is placer mining? By what other methods is gold mined?

Which is the more useful metal, gold or iron? What reasons can you give for your opinion?

What makes copper so valuable? What metal has been the most recently introduced into the arts?

Where are the great iron and steel mills of the country located? What are the reasons for their location?

What is steel? In what respects is it superior to iron?

Name some of the uses for which iron is employed.

What has made the United States the leading nation in the production of iron and steel?



## CHAPTER X

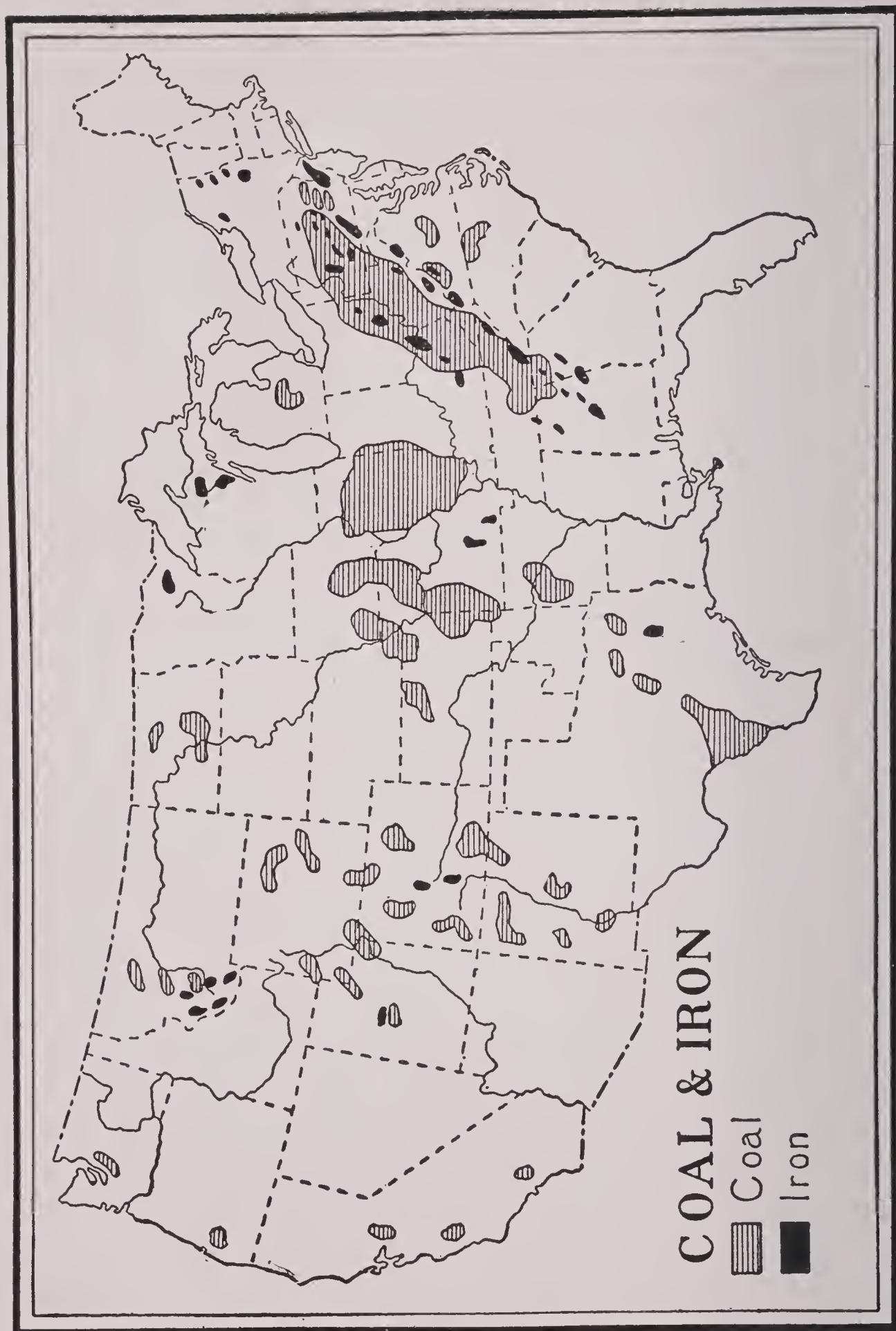
### NON-METALLIC MINERALS

A number of minerals are valuable on account of their use as fuel. The most important of these found in the United States are coal, petroleum and natural gas.

**COAL** Coal is found in seams, or veins, buried in the earth. It is widely distributed, and is found in many countries of the north temperate zone and in some portions of the north frigid zone, particularly Alaska. South of the Equator it is known to exist in Australia and South Africa.

**Formation** In the lowlands, in cool, temperate climates, we frequently find swamps in which, for many years, mosses, several varieties of ferns, rushes and reeds have been growing. From year to year, these partially decay at the bottom and the new growth of the succeeding seasons springs from the bed formed by their decaying vegetation. From two to four feet below the surface a formation is found that closely resembles the vegetable mold of soils. When dried, this forms excellent fuel, and is known as peat. Were peat subjected to great pressure and heat, under such conditions that the air could not reach it, it would be changed to coal.

Coal has been formed from the vegetation of the past ages by processes similar to those described in the formation of peat. This vegetation grew many centuries before any animal life existed upon the earth, and was much more luxuriant than vegetation that we find at the present day, even in tropical regions. The evidences found in coal mines tend to prove that, in the period in which these plants thrived, ferns and club-mosses grew to the size





of trees, and that these forms were interspersed with several species of large trees entirely different from anything that now exists upon the earth. These luxuriant growths of vegetation were, by movement of the earth's crust, sunk beneath the sea and covered with mud, which in time became hardened into rock. The heat produced by the pressure and movement of the rocks in the course of ages changed this vegetation into coal. The plants were so completely excluded from the air, and were subjected to such great pressure, that the coal is harder and much more perfect than charcoal, which we obtain by burning wood, or other substances, in closed vessels.

Some time after the first growth of vegetation, the land again rose above the surface of the sea, and another growth appeared, which, in its turn, was also buried and changed to coal. In some localities this process was repeated a number of times, each repetition being marked by a vein of coal. Consequently, we find the veins separated from each other by layers of rock varying in thickness from a few inches to hundreds of feet. As a general thing the coal in the lowest veins is the hardest and of the best quality, but in the mountainous regions of Pennsylvania, and some other portions of the world, the veins have been tilted so that they are now found in an oblique position, and it is not always the lowest vein that is the oldest. In the more level regions of Ohio, Indiana and Illinois, the veins are found in much the same position as they were when formed, and extend in a horizontal direction.

Some of the veins are only a few inches thick, while others attain a thickness of from ten to twelve feet. If a vein is less than three feet thick, it can not be profitably worked on account of the expense of excavating the amount of rock necessary to secure the coal. There are a number of varieties of coal, indicated by their composition and degrees of hardness. Those of the latest

formation are the softest and least valuable. The varieties generally known are lignite, bituminous, cannel and anthracite.

**Lignite** Lignite is a variety of soft coal that is less valuable than those that follow. In formation it is between peat and soft coal; it still retains the reddish hue, like peat, and crumbles readily. Lignite is found in a number of states west of the Mississippi, and is mined to some extent in Colorado, the Dakotas, Montana, Wyoming and Oklahoma. Since these states are located a long distance from the bituminous coal fields, lignite constitutes a valuable and convenient source of fuel. It has never been used in engines, or for manufacturing purposes on a large scale, but it is successful as a heating fuel. Lignite mines have not yet been developed to any extent, but as the demand for fuel in states west of the Mississippi increases, these mines will grow in importance and lignite will supply most of the local needs for domestic and other heating purposes.

**Bituminous** Bituminous coal is much softer than anthracite, and contains more oil and vegetable matter than carbon. When broken, the best quality leaves a glossy or jet-like surface. It burns with a bright flame and dense, black smoke, and gives off an intense heat. Bituminous coal is much more generally distributed than anthracite. In the United States it is found in Western Pennsylvania, West Virginia, Southern Ohio, Indiana, Illinois, Iowa and Missouri. It also constitutes a great part of the coal mined in England and on the continent of Europe. This is the coal generally used in making coke, for smelting iron and for other manufacturing purposes.

**Cannel** Cannel coal is a variety of bituminous which occurs only in small quantities. It is sometimes used for making ornaments, because, when polished, it very closely resembles jet. It is also highly prized for burning in open grates,





# UNITED STATES

SCALE OF MILES

0 50 100 200 300 400 500  
The George F. Cram Co., Chicago

120° 110° 100° 90° 80° 70° 60° 50°  
Longitude  
West from Greenwich  
1 2 3 4 5 6 7 8





as it burns with a bright flame and with little smoke. When a piece is ignited at the end, it continues to burn like a candle until entirely consumed—a peculiarity from which this variety of coal takes its name. Cannel coal has passed through the bituminous stage and is nearly as hard as anthracite.

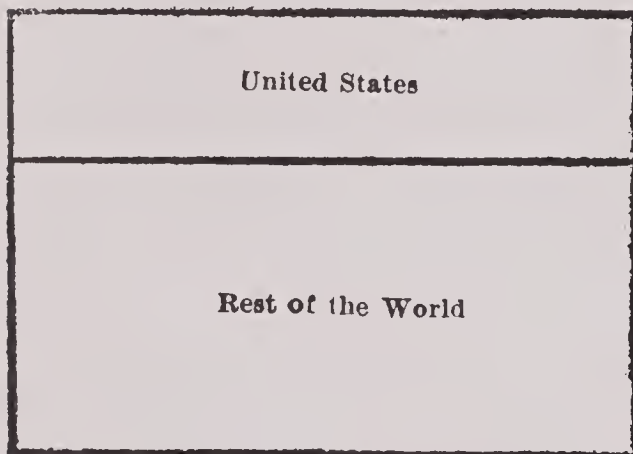
**Anthracite** Anthracite is the hardest and the most valuable coal found, either in America or England. Nature has made it by causing soft coal to be subjected to such heat and pressure that most of the oils and gases have been driven off, leaving the almost pure carbon. It has a black, glossy appearance, and burns with but little flame but with intense heat. On account of its hardness and its appearance it is often known as hard coal, and sometimes as stone coal. The largest mines of anthracite now worked are found in the eastern portion of Pennsylvania; small quantities are obtained in Nova Scotia and England.

**Coal Measures** The layers of rock in which coal is found are known as coal measures. The important coal measures in the United States are found in Pennsylvania, West Virginia, Ohio, Indiana, Illinois, Michigan and Alaska. There are also measures of lignite, or soft coal, found in nearly all of the states west of the Mississippi, in small patches or large areas. Taken together, these coal measures have an area exceeding four times that of the state of New York, and a depth which has not yet been ascertained, as the veins near the surface will, with but few exceptions, be the only ones worked for years to come. This shows us that our country has a sufficient supply of coal to last its people for many generations and for all purposes. This is one of the greatest sources of our prosperity, for without coal it would be impossible to supply fuel to many portions of the country, and without fuel these regions could not be inhabited. Also, as already noted in the chapter on iron, coal is necessary for most manufacturing purposes, and were it not for the extensive supply

of this commodity many of the manufacturing industries would be impracticable, if not entirely impossible.

### Mining

Coal is mined by sinking a shaft into the earth until it cuts the vein. This shaft is a rectangular excavation, usually about thirty feet long and twelve or fourteen feet wide. It is divided into four compartments by vertical partitions. In two of these the hoisting cages, which are nothing more than freight elevators, operate; another is used for ventilating the mine; and the fourth for pipes used in pumping out water, for electric



COAL

wires and other appliances that may be needed to make connection between the mine and the works above.

From the foot of the shaft, galleries are excavated in all directions. These galleries are intersected at frequent intervals by cross galleries, so that in a mine which has been worked to any extent, they resemble quite

closely, in their arrangement, the streets of a city. Tramways are laid in the main galleries, and upon these cars are run, either hauled by mules or electric locomotives. As the coal is broken from the veins, it is loaded upon the cars, which are hauled to the foot of the shaft and run upon the hoisting cages. As the cars reach the surface, they are run from the hoisting cages to a platform, where they are unloaded by being dumped into a chute, where the coal is separated into various sizes. Each size is loaded separately, either upon the car or into the boat, as the location of the mines requires, and sold as nut, egg, etc., according to its size.

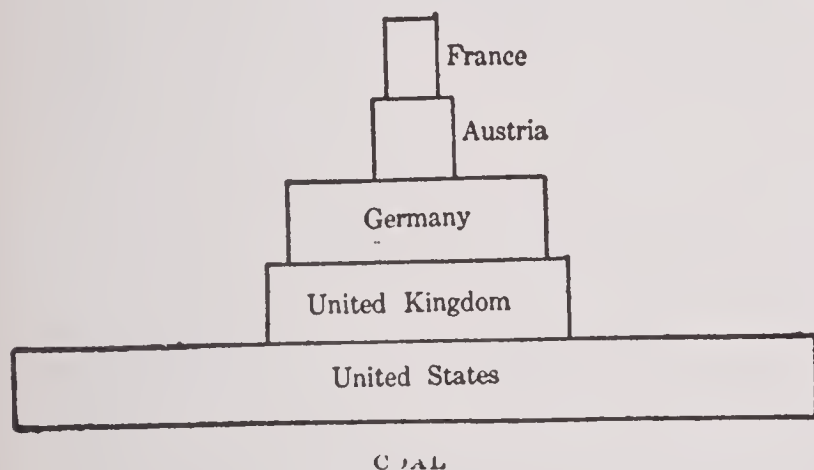
### Transportation

Whenever possible, coal is transported from the mines by boat, but in all other cases by



railway, and is taken to all cities and towns in the country. Very much of the local expense of this fuel comes from the freight, and localities far from the coal mines pay much higher prices than those near by. We have already seen, in our description of iron, that the transportation of coal from the lower to the upper lakes constitutes an important factor in the traffic of the ore boats. Besides these lines of steamers, there are numerous others that are engaged in carrying coal from Cleveland, Erie, and other large cities, to the Great Lake ports. Most of this coal has to be hauled to the wharf by train, where it is loaded upon the boat, from which

it is again transferred to the docks, to be taken by train to its final destination. Yet, notwithstanding all of this handling, the freight by water is much cheaper than it would be were the coal hauled to the Northwest by railway.



**Coke** A great deal of coal in West Virginia, Western Pennsylvania and Ohio is manufactured into coke. This is done by burning the coal in kilns, called ovens. The air is partially excluded so that only the gaseous matter is burned, leaving a kind of charcoal, which constitutes the coke. Coke is used in smelting iron ore, and for some other manufacturing purposes, and to some extent for heating. The coal cannot be used in smelting iron because it contains sulphur, which is injurious to the metal.

**Uses** The uses of coal are so numerous that it would be difficult to enumerate them all. It is the source of all our steam power; we depend upon it for nearly all transportation, both by land and water, in the manufacture of iron and steel, and of other

metals; for warming our houses and places of business, and for the manufacture of illuminating gas. The use of coal is so thoroughly identified with our life and industries that, were its supply to cease, the business of the country would be demoralized. No more impressive lesson of the relation of this mineral to our industrial life could well be given than that resulting from the shortage of coal in the winter of 1902-03, caused by the great coal strike in the anthracite mines in Pennsylvania. New York, Boston, and many other large cities in the Eastern states, which depended almost entirely on this source of supply for their coal, were obliged to close manufactories, to reduce the number of trains upon their railways, and in many other ways change the ordinary run of business, while many people were deprived of their usual supply of fuel for domestic purposes.

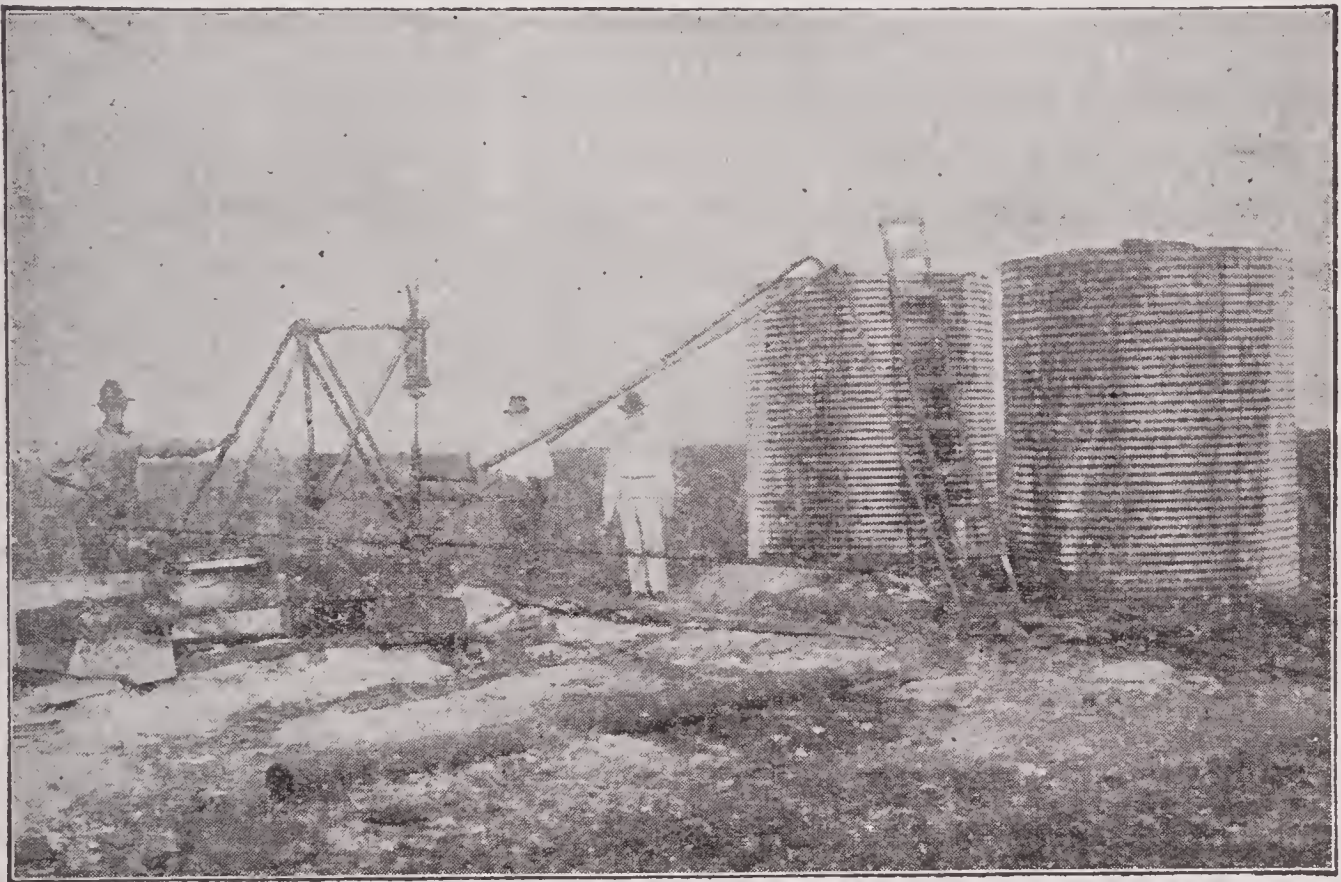
The annual output of coal in the United States is about 531,000,000 tons of 2000 pounds. Eighty-nine million tons of this are anthracite and the balance bituminous. The United States produces the largest amount of coal of any country in the world. It is closely followed by the United Kingdom, which, until within a few years, was the leading producer. Germany produces about 150,000,000 tons, and other countries only small quantities. These countries are also the three greatest manufacturing countries.

**PETROLEUM** Next to coal, petroleum is our most important mineral fuel. It is found in reservoirs in the earth, and is obtained by boring wells. The name, which means rock oil, was given it because the oil was obtained by boring into soft layers of rock, which are saturated with oil. The regions in which it is found are known as the oil fields. In the United States these are located in western Pennsylvania, West Virginia, the southern part of Ohio, portions of Indiana, the southwestern part of Illinois, in Colorado, southern California, Texas, Kansas, and Oklahoma. The most important foreign fields are around the Caspian Sea and in the Island of Java.



**USES** The uses of most of the petroleum products are very familiar.

The growth of the automobile industry has created such a demand for gasoline that the refineries can scarcely fill their orders, and since 1910 the price of gasoline has rapidly advanced. Benzine and naphtha are used for dissolving gums in the manufacture of varnish, in mixing paints and for laboratory purposes. The invention of a mantle for kerosene lamps, similar to that used on gas jets, has greatly



OIL WELL AND STORAGE TANKS

increased the illuminating power of kerosene; nevertheless, electricity and acetylene gas have almost entirely displaced this illuminant, except in rural districts.

Crude petroleum is used as a fuel in localities where coal and wood do not occur. For this reason the discovery of oil in California and Texas has been of great advantage to the people of those

regions. **The oil from** these fields is extensively used, not only for heating and cooking purposes, but also as a fuel in locomotives and for driving stationary engines. This use of petroleum has greatly facilitated transportation on several lines of railway in Arizona, New Mexico, and southern California. It is also a desirable fuel for steamships, on some of which it is replacing coal.

**Transportation**      The growth of the oil industry has led to many new developments in the methods of transportation. At first it was carried from the wells in barrels, which were hauled on wagons to the nearest railway station or refinery, but the poor roads made this method almost impracticable. Whenever possible, the oil was loaded onto boats, some of which had tanks constructed for the purpose, while others received the oil in barrels. These were floated down the rivers to the point of destination or of trans-shipment, but the railway soon became the most important factor in the transportation. At first the barrels were loaded on the cars, but in a short time tank cars, constructed especially for the purpose, came into use. These cars are now familiar in all parts of the country. The tanks resemble a huge steam boiler with a dome, and have a capacity of several hundred barrels. Oil receiving stations are now established in every large town. These stations contain large steel tanks into which the oil is unloaded from the cars, and from which it is distributed to merchants in tank wagons. From the merchants it reaches the consumer.

But in the large oil centers, pipe lines have since taken the place of cars. These lines are laid similar to gas or water pipe systems. Small pipes run from each well to large mains which finally unite into one large line that leads from the oil field to the refinery. The pipes are made of steel and are of great strength. By their use, oil can be conveyed hundreds of miles without handling. Pipe lines



extend from the oil fields in Pennsylvania to Philadelphia, Pittsburgh, Cleveland, Baltimore and New York City. Another long line is one reaching from Kokomo, Indiana, to Chicago. Pumping stations are established at frequent intervals, by the use of which the oil is forced along on its journey.

The world's output of petroleum amounts to about 515,000,000 barrels a year, and in 1920, the output of the United States was 443,402,000 barrels. Russia, which formerly occupied the second place as a producer, was exceeded by Mexico. Important oil fields have recently been opened in the Dutch East Indies, in Colombia, South America and in Canada, north of Great Slave Lake. The United States exceeds all other countries in the manufacture of petroleum products.

### **Natural Gas**

Natural gas is an important mineral fuel. It is usually found in the same localities as petroleum.

For a number of years it was extensively used in Southern Ohio, western Pennsylvania, and central Indiana, where it was employed in the manufacture of glass and in smelting iron and steel, but the supply in those regions is nearly exhausted. Other regions have been discovered and natural gas is now plentiful in Kansas, Oklahoma and a few other states. The supply in 1920 for the United States amounted to \$159,650,000.

### **QUESTIONS**

Examine a piece of charcoal. How does it differ in structure and hardness from anthracite? From bituminous coal?

From what region is the coal used in your locality obtained?

Why is coal more expensive in Minnesota than in Illinois?

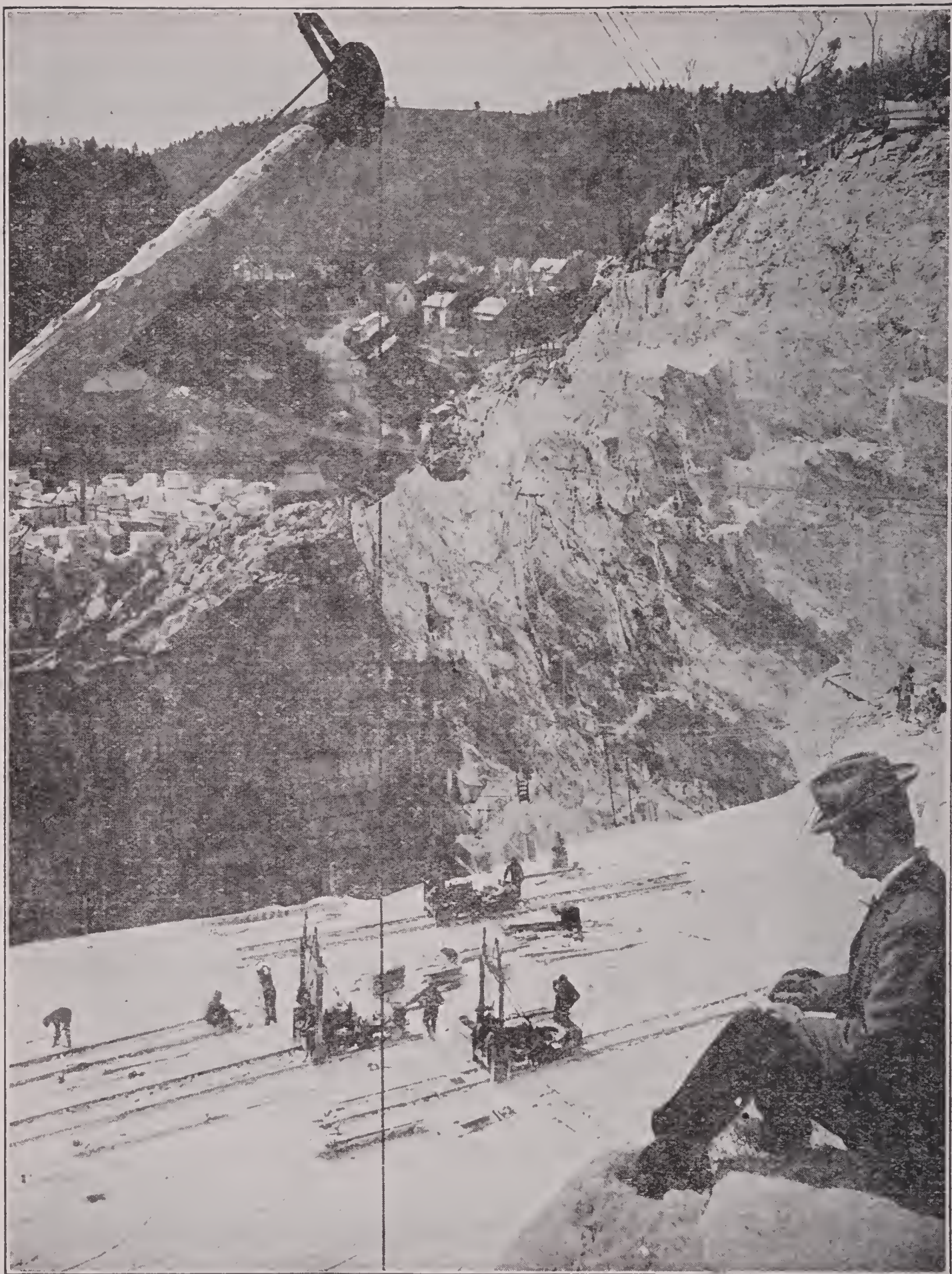
Where are the great coal docks of the United States located? Give the reason for their location.

What products are obtained from petroleum? Which of these is the most valuable?

What is meant by "refining" petroleum? Where are the great refineries located?

How can you account for the rapid growth of the petroleum industry?





MARBLE QUARRY, RUTLAND, VT.



## CHAPTER XI

### ROCK AND SOIL PRODUCTS

#### **BUILDING STONE**

Building stone includes marble, limestone, granite and slate. Limestone is one of our most common rocks. It is hard and strong and it withstands the action of the weather. It is, therefore, extensively used for foundations of buildings, the abutments and piers for bridges and for the walls of large structures where a fine finish is not required. Some varieties are extensively used in the manufacture of quick lime; others are used in making cement.

#### **Marble**

Marble is crystallized limestone which was changed and purified by heat after the rock was formed. It is found in large quantities in Vermont, Georgia, Colorado, Tennessee and Alaska. There are many varieties, and marble is found in almost all colors, from jet black to pure white. Marble is used for finishing interiors, for statuary and for the walls of public buildings where a fine finish is required, but it does not withstand weathering as well as most other building stones.

Marble of the finest quality is found in Italy, but the quarries are worked by hand labor and the output, compared with that of the United States, is small.

#### **Granite**

Granite is the hardest and strongest of all the building stones. It varies in color from nearly white to a very dark gray, which is almost a black. Some of the best granite has a reddish color. This rock occurs in many places, but is extensively worked in the New England states and Minnesota. It takes a high polish, and withstands the action of the weather better than marble. For this reason it is now quite extensively used for headstones and statuary that is to be placed in public parks. Granite is especially valuable as a building stone where great strength is required, as in the piers of railway bridges, and for the foundations and walls of large buildings.

**Slate** Slate is a clay rock, which occurs in thin layers. On account of its structure, it is easily split into very thin slabs. The most extensive quarries are in Pennsylvania and Vermont. Slate is used for covering roofs, for finishing interiors and for making laundry-tubs, sinks and blackboards.



**A GRANITE QUARRY**

(Courtesy of McDonnell & Sons, Inc., of Buffalo, N. Y., and Barre, Vt.)

**Clay** Clay is a very common mineral and is found in almost every locality. When dry, it is quite hard, but when moist it becomes plastic and can be easily worked, either with tools or with the hand. It is not used alone as a building material, but, when combined with a certain proportion of sand, it constitutes the material from which brick, tile, terra cotta and other products are made.



**CEMENT** Numerous kinds of cement are on the market. Nearly all of them are made by the grinding of some variety of limestone with another rock and burning the mixture. Hydraulic cements will harden under water and are used in cementing cisterns and stones in the piers of bridges and other structures exposed to water. When mixed with crushed stone and sand, cement forms concrete, which is extensively used for foundations of heavy buildings and bridges, for surfacing roads and laying sidewalks.

The industries arising from the use of these materials are extensive and important. From the nature of the material they are also decidedly local in character. All of this raw material, on account of the expense of transportation, must be worked in its immediate locality; therefore, we find brick yards where clay is abundant, and works for cutting and finishing stone at, or near, the quarries, as the finished product can be transported at much less expense than the raw material.

**SALT** Salt is especially important, because it is the only mineral used as an article of food. It is obtained by evaporating the water of the sea or salt lakes, or from salt springs and wells, and by mining, when it occurs in deposits in the earth. Most of the salt manufactured in the United States is obtained from salt wells. These wells may be natural or artificial. They are natural when the salt water is found in the earth and can be obtained simply by pumping. They are artificial when the salt water is procured by pouring fresh water into the well and allowing it to dissolve the salt from the vein in the earth and then pumping it out. Salt works in the United States are found at Syracuse, N. Y., and at numerous places in Michigan and Ohio. Nearly all the salt manufactured at these places is of a high grade and is used for table and dairy purposes. Salt is also used in the manufacture of various compounds of soda and for glazing a cheap quality of pottery ware.

**GRAPHITE**

Graphite, or black lead, is a variety of carbon. The largest deposits in the United States are in the vicinity of Ticonderoga, N. Y., where it is quite extensively mined. Graphite is a very valuable mineral and is used in the manufacture of lead pencils and crucibles, for lubricating machinery and for various kinds of polish.

**IMPORTANCE**

The combined mineral industries of the country rank, in importance, next to those of agriculture. As we have seen, they are widely distributed and give rise to a large number of occupations. On this account, it is impossible to separate some of them from manufacturing industries.

**QUESTIONS**

What rocks in your vicinity are used for building or other purposes? Make a collection of specimens of the different minerals in your town or county.

What are some of the articles made from clay? Why are bricks and pottery "burned"?

Name the different purposes for which you have seen marble employed.

Why does the United States quarry so much more marble than Italy?

What are the different purposes for which salt is used?



## CHAPTER XII

### MANUFACTURING INDUSTRIES

#### IMPORTANCE

Next to agriculture, manufactures are the most essential condition to a country's prosperity, and the position of a nation in the scale of civilization is closely related to the extent and variety of its manufacturing industries. These industries make use of the natural products of a country. Before these materials are manufactured, they are known as raw material. Timber, iron-ore, corn, and stone are good illustrations.

Manufactures increase the wealth of a country by turning out products that are far more valuable than the raw material. This value is added almost entirely by the labor expended in transforming this material into the manufactured product. The goods of the factory are also sold at a much greater profit than the products of nature. In addition to this, manufactures give rise to a great many occupations, and among these each one can find an opportunity to do that for which he is best suited. This enables men to produce more than they could if all had to work at the same occupation, for each succeeds best by following the vocation suited to his tastes. Manufactures also increase the demand for goods. The great number of callings in a manufacturing community multiplies wants. The blacksmith needs tools and raw material of one sort; the carpenter those which are not suited to the blacksmith, and the weaver still others, so that in order to supply the needs of all, a great variety of commodities becomes necessary.

#### LOCATION

The location of manufacturing industries is determined quite largely by geographical conditions. The most important of these are the presence or proximity of raw

material, available power, good transportation facilities and an accessible market for the manufactured articles. The first cause is of such nature that it can be, and often is, overlooked, as raw material is frequently transported a long distance before it is converted into the manufactured product.

**Power** In the early history of the country water power was universally employed for propelling machinery, and we find the manufacturing industries located in New England and the North Atlantic States, where the numerous small mountain streams furnished an abundance of power. Here were erected the first cotton mills, and cotton was brought to them from the South. Here also were established the first smelting furnaces for the reduction of iron-ore, but both the ore and the fuel were found near at hand.

**Steam Power** The advent of the steam engine removed in a measure the necessity of locating factories where water power could be obtained. The only disadvantage in the use of steam is that it is more expensive than water, yet it often happens that the expense of fuel is less than the difference in the cost of the transportation of the raw material and the manufactured product. For this reason we find steam sawmills erected in or near the lumber camps, and flour mills on the prairies of the wheat growing states. The use of steam power has also made it possible to locate manufactories in and near the great centers of trade, where they can secure the advantage of the means of transportation which are found in such centers. The effect of steam as a motive power has been to establish large factories through the Central and Western States which by their output now have a strong influence upon the manufactures of the older states. While these states are still the leading manufacturing centers of the country their relative importance is very much less than it was. Moreover, many factories using hydro-electric power are in small towns.



**Electric Power** The application of electricity to the operation of machinery has greatly extended the possibility of placing factories wherever their location would be most advantageous. It has also brought into use the water power of hundreds of streams that before were entirely useless, because their location was such that no factories could be erected on or near them. Now, by means of electric cables power generated by mountain streams may be applied to the operation of motors scores, and even hundreds, of miles away.

Many cities and factories obtain their power from electric plants many miles away. Among the largest of these plants are those at Niagara Falls, which furnish Buffalo and other cities with light and power, besides supplying current to a number of large manufactories; and the plant at Keokuk, Iowa. These plants use a large volume of water, but in some places mountain streams with a small volume of water having a high fall furnish proportionately more power. A plant of this type on the Yuba River in California has a fall of 700 feet and the current is carried to San Francisco, in addition to supplying cities at a less distance with power and light. There are millions of horse power in the undeveloped water-power sites of the country awaiting the coming of enterprises to bring them into service. There is a tendency to form large syndicates to obtain the hydro-electric power over large areas and distribute it to consumers.

**Transportation** Transportation is a very important factor in determining the location of the manufactory, as the expense of freight greatly reduces profits. Transportation by water is cheaper than that by railway; therefore, the manufacturers of heavy wares endeavor, as far as possible, to locate where they can ship their products by water routes; hence, we find that many ports on sea, lake and river have become important manufacturing centers. The railways have made inland transportation comparatively cheap, and many factories are established in a locality

where their product is used. The great agricultural implement factories of Chicago, and the furniture and piano factories found in numerous western states, are good examples of such location.

The rapid extension of electric railways is also advantageous to small factories in country towns, since these railways afford a cheap and convenient means of transportation of both the raw material and the manufactured product. These roads seem destined in the near future to exert considerable influence in locating manufactories.

The most important economic reasons in determining a location are an early beginning and a local demand for the product. The New England factories obtained their hold upon the country largely because they were the first of their kind. While, in the beginning, their output supplied only the local demand, yet, in a short time, they were enabled to supply the demands of a much larger territory, and by being in condition to take advantage of these demands they obtained a hold upon the country, which has made it impossible for later establishments of the same sort to displace their goods.

The local demand for boots and shoes, flour, furniture and many other common articles, is the principal cause for the erection of so many factories in the West and Northwest, and most of these are doing a thriving business.

### **MANUFACTURING CENTERS**

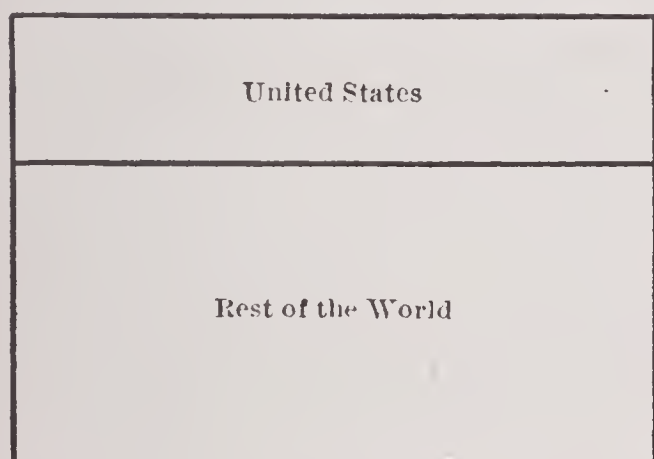
Most cities have been built up around manufacturing industries, or have had manufactories added after they were established. The beginning of Minneapolis was in the erection of sawmills and grist-mills. At the time the first mills were erected, the lumber and the water power were near each other. As the Northwest became settled, the demand for manufactured products increased, and the city added steam power to her water power and continued to increase her mills until she became the largest flour producing



city of the world. The importance of Lowell, Fall River, and New Bedford, Mass., is due almost entirely to their cotton mills. This is equally true of many other towns in New England and New York; while Birmingham, Ala., has been developed into a thriving city on account of its favorable location for the manufacture of iron and steel.

The United States is the largest manufacturing country of the world. The value of her manufactured products exceeds \$24,000,000,000 a year, which is more than twice the value of the manufactures of the United Kingdom. The country is also noted for the variety of its manufactures. This is caused by our great extent of territory, difference in climate and the diverse local con-

ditions which adapt so many localities to special lines of manufacture. In addition to this, the inventive genius of the American people, and their high standard of living have created demands for a great variety of products. The greater part of our manufactures are consumed at home, leaving only a small portion for export.



MANUFACTURES

With the increase in population it is probable that a still larger proportion of our manufactures will be required for home consumption. If this should be the case, our exports would fall off. However, this condition of affairs would not necessarily indicate a lack of national prosperity. Every country makes such uses of its products as are best suited to its economic conditions, and the amount of exports is not always a true indication of a country's prosperity.

## QUESTIONS

Show how manufactures increase the wealth of a country.

What effect has the development of electric power had upon the location of manufacturies? Is this beneficial? Why?

Why were the first manufacturing centers located in the New England and the Eastern States?

Why was the erection of cotton mills in the Southern States so long delayed?

What causes make the cities located on the Great Lakes important manufacturing centers?

What causes have combined to make the United States such an important manufacturing country?



## CHAPTER XIII

### IMPORTANT MANUFACTURES

Clothing is necessary to life and comfort, and the farther a people are removed from the equator, the more indispensable it becomes. We use clothing for three purposes: decency, comfort and ornament, and because they are so intimately associated with our welfare, the products of the textile industry maintain an especially intimate relation to us.

**TEXTILES**           The manufacture of textiles is one of the most important industries of the country and the world, and it seems eminently fitting that the people who make the wisest use of the textile fabrics should become the most skilful in their production. These are the people of the temperate zones, and the nations of the north temperate zone now practically supply the fabrics for the world.

There are various branches of the textile industry, such as the manufacture of yarns, knit goods and woven goods; and to these must be added the art of dyeing, which is a feature of each branch. The fibers used in the United States are, in the order of their importance: cotton, wool, silk, flax and hemp. In some fabrics we find two or more of these fibers mixed. The most common mixture is that of cotton with wool. Silk is also mixed with wool, and with cotton, and, occasionally, with linen. These mixtures enable the manufacturer to produce a much larger variety of fabrics than he could by using only one kind of fiber. This variety is also increased by the degree of fineness of the work and by various methods of weaving and finishing the cloth.

**History**      The manufacture of textile fabrics in America began with the settlement of the colonies. Every household had its spinning-wheel and hand-loom, and nearly every farmer raised sheep and flax, and it was a part of the work of the women in each family to manufacture the cloth required for clothing and bedding. Since all this work had to be performed by hand labor, and with the crudest machinery, the task was no light one. When the population had increased to such an extent as to cause numerous towns to spring into existence, small factories were erected, which, in a measure, relieved the women from manufacturing cloth, though, in the farming communities, this practice continued for many years after the Revolutionary War.

While in the beginning simple machinery operated by hand power made it possible for any one to engage in the manufacture of yarn or clothing, with the advent of the factory more complex machinery was introduced. This required an investment of capital, and as the industry grew we find that factories increased in size and capital became more and more concentrated, until the textile industry was located in a few large centers of the New England States, the most important being Lowell, Fall River, and New Bedford, Massachusetts; Nashua and Manchester, New Hampshire, and some towns in Rhode Island and Connecticut.

During the last quarter of a century the United States has made much greater progress than other countries in the manufacture of textiles, though she does not lead the world in her output of this product. Some of the most delicate and ingenious machinery employed in the production of the finest and most beautiful fabrics is the product of American ingenuity, while American methods of management have made it possible to operate the large factories in this country on such plans as to produce better results than have been secured in the countries of Europe.

The development of the textile industry is due to four inven-



tions: The spinning-jenny by Hargreaves, the water frame by Arkwright; the mule-jenny, which was a combination of the spinning-jenny and the water frame, by Richard Compton; and the power-loom by Edmund Cartwright. All of these inventions originated in England and were produced by English workmen. Each made it possible for one operator to do the work that it would require scores of persons to perform by hand labor. The first of these inventions came into use in 1767, and the last in 1785. Thus within a period of eighteen years the textile industry of England was revolutionized by the ingenuity of her workmen.

The increase in cotton manufacture, resulting from these inventions, created such a demand for cotton that it was impossible for the planters to raise and prepare a sufficient quantity to supply the market. This difficulty was met by the American invention of the cotton-gin, by Eli Whitney, in 1792. This has already been described in the chapter on cotton. Historians are agreed that no other inventions ever did so much for a people as have the inventions named for the English-speaking nations, and it is in these nations that the manufacture of textile fabrics has reached its highest development.

Factories seldom deal with retail merchants or customers. When the goods are finished they are put up in bales of from twenty to fifty yards each, and the most expensive qualities are carefully wrapped in paper before boxing. The goods are shipped from the factory in large boxes or cases, and are sold directly to the wholesale merchant, through whom they reach the retail trade which disposes of them to the individual customers. Besides the goods manufactured in this country, large quantities of woollens and silks are imported, though American goods are sometimes placed upon the market as imported, and the product of the American mills is of such quality that it is often difficult to distinguish between the finest fabrics made at home and those of

France, Germany, or England. Japanese and Chinese silks can easily be distinguished because of their peculiar fiber. No mills of America or Europe manufacture a fabric of this type.

**Cotton** The manufacture of cotton is the largest and most important textile industry in the United States. The industry is most fully developed in the New England States, where the first looms were placed in operation, and in South Carolina and Georgia. The manufacturing is done in large factories and practically all the work is done by machinery. There are many varieties of cotton fabrics on the market, each adapted to some special need.

#### COTTON BY COUNTRIES IN BALES

COUNTRY.	BALES.
United States .....	11,425,000
British India .....	4,743,000
Egypt .....	999,000
Uganda .....	28,070

**Woolens** Woolens were the first textile fabrics manufactured in America. The fiber of wool is much more easily worked than that of the cotton plant. Woolen fabrics are especially suited for clothing of people following the vocation of agriculture, and living in a cool climate. The fiber can be spun and woven by the use of the most simple machinery, and is particularly suited to the conditions which are always found in a newly settled country. We have already noted how cloth was manufactured in the homes of our forefathers. The advent of machinery caused this industry gradually to change from the homes to the manufacturing centers, until now spinning-wheels and handlooms are so rare that they have become curiosities.

In extent, the woolen industry does not equal that of cotton, yet, owing to the greater value placed upon woolens, the value of



In extent, the woolen industry does not equal that of cotton, yet, owing to the greater value placed upon woolens, the value of the yearly output in 1915 was \$435,978,000, an increase of 75.2 per cent in ten years. As in the manufacture of cotton, the United States is also exceeded by England in the manufacture of woolen goods.

**Silk** The people of the United States are the largest users of silk in the world. Much of this is imported, but a large quantity is also woven in this country. Several attempts at growing silk have been made in the United States, but they have never succeeded because it requires so much labor to raise the silk worms that the United States can not afford to compete with other countries in this industry, and our silk mills are obliged to obtain their raw product from France, Italy, Japan, and China. The silk usually reaches the American manufacturer in skeins, just as it is wound from the cocoons. It is then ready for the process known as throwing, which is the silk manufacturer's term for spinning, or twisting. After throwing, the silk is ready for weaving and is passed to the looms. The great silk mills are nearly all located in New Jersey, Pennsylvania, and Connecticut. Probably nine-tenths of the silk manufactured in the country is made in these states. An important feature of this industry is the manufacture of sewing silk, to which entire mills are devoted.

The value of silk manufactured in 1914 was about \$197,000,000. This industry has the peculiar feature of importing its raw material from a great distance, for the purpose of manufacturing it at home. Aided by government protection, the manufacture of silk, which started in a very small way, has now become an industry of considerable importance and one of great value to the people, because goods of the same quality can be manufactured in the United States and placed upon the market at a lower price than they can be imported from either Europe or China. The demand for cotton and woolen fabrics during the World War was a great stimulus to the silk industry in the United States.

**Linen**

Cottons, woolens and silks, in the order named, are the textiles manufactured in large quantities in the United States. The manufacture of linen is carried on only to a limited extent, and we depend almost entirely upon Holland and Ireland for our choice linen fabrics.

**FURS**

The skins of animals have been used for clothing in all ages. When preserved with the hair on, they are known as furs, and in this form the skins of some animals, particularly the otter, the sable and the fur-seal, constitute some of the most beautiful and expensive material from which wearing apparel is made. Most of the fur-bearing animals live in a cold climate and in regions sparsely populated. Only a few are now found in the United States, and the taking of animals for their furs is no longer an important industry of the country.

**LEATHER**

When the skins of animals are dressed without the hair, they form leather. Raw skins from cattle and horses are known to the trade as hides, while those from small animals are designated as skins, as sheepskins, calfskins and goatskins. Leather has become such a necessity that none of the leather manufacturing countries produce enough hides from the animals killed to supply themselves with shoes, so in many of the grazing regions of the tropics and the south temperate climate thousands of animals are killed just for their hides, to ship to the United States and some countries of Europe, the carcasses of these animals being left as useless.

**Uses**

The most extensive use of leather is for the manufacture of boots and shoes. The uppers of men's shoes are made from calfskin and goatskin, also other leather obtained from the hides of young cattle. The uppers of women's shoes are usually goatskin or sheepskin, according to the grade of shoe. Other important uses of leather are for harness, belting for machinery, upholstering furniture, the manufacture of gloves and mittens, and bookbinding.

The United States is the leading country of the world in the



manufacture of leather, both in quantity and the quality of its product. Its tanneries produce enough to supply all home markets, and also to enable them to export large quantities. This requires more hides than can be obtained from the meat-packing industry in our own country, and the balance is supplied from the countries of South America, mostly from the Argentine Republic. Our annual output of leather exceeds \$500,000,000 in value.

### **BOOTS AND SHOES**

Formerly all boots and shoes were made by hand. Each shoemaker performed all the labor necessary to complete the shoes, and this method of manufacture continued until long after the Revolutionary War. For years it was customary for the shoemaker to travel from house to house with his kit of tools and make up the leather into such footwear as the family needed. When the country became more densely populated, the shoemaker found it to his advantage to remain in one location and have his customers come to him. So the shoemakers built small shops, in each of which one or possibly two men worked.

The development of the boot and shoe industry, from these early stages to its present condition, is of great interest because it shows more clearly than the growth of any other industry, what has been accomplished through the division of labor and specializing the occupations of workmen. It is considered that the boot and shoe industry is the most perfectly organized of any manufacturing industry in the country. This evolution had its beginning in the city of Lynn, Mass., which, with Brockton, are the most important centers of the industry. There were many small shoe shops in Lynn in each of which all the processes necessary to the manufacture of boots and shoes were carried on. Several of the proprietors of these shops decided that it would be to their advantage to combine and divide the different processes among their workmen so that each man should give his attention to only one of the various processes. Some workmen were set to cutting the patterns

from the stock, others to sewing these together, and still others to fastening the uppers to the soles. The result of this venture was so satisfactory that large shops soon took the place of the small ones, and these finally gave place to the shoe factory.

The modern shoe factory is the result of the application of machinery to the manufacture of boots and shoes. As soon as the sewing machine was adapted to this work, it greatly increased the possibilities of the shoe shops, and this machine has now been adapted to all of the different uses to which a sewing machine can be put in the manufacture of boots and shoes. Some machines sew on the buttons, others make the button-holes and others sew on soles. The invention of other machines has kept pace with the modifications of the sewing machines, so that now almost every process required to produce a shoe is performed by machinery.

Massachusetts is the leading state in the manufacture of boots and shoes, but the industry is more generally scattered over the country than the textile industry. Large factories are now found in nearly all the important cities of the Union, and through the Central and Western States occasional factories are seen in small towns. St. Louis and Cincinnati are the leading centers for the West and their production is rapidly increasing each year. As in the manufacture of leather, the United States leads the world in its production of boots and shoes, both as to quantity and quality. Our annual output exceeds 590,000,000 pairs, and the value in 1914 was \$501,760,586. This was greatly increased by the war in Europe.

#### **PRINTING AND PUBLISHING**

Printing has, more than any other industry, contributed to human advancement. It has been the means of preserving the wisdom of the past, and scattering it abroad in the present. At the same time it has kept mankind informed of the world's progress from day to day. Printing is related to every other industry, and without it,



business methods now in general use would have to be abandoned. Without printing, business men could not read of the state of the markets on their way to the office in the morning, nor learn of the day's transactions as they return from their labors. Printing also increases the general intelligence of a people, and this leads to a multiplicity of needs that continually create demands for new products. From every point of view, we find printing to be the handmaid of all industries, and no account of our industrial and commercial life is complete without a sketch of the publishing business.

Printing and publishing are directly connected with the manufacture of paper, the making of printing-presses, of type and type-setting machines, and the manufacture of printers' supplies. While each of these industries is in itself of considerable importance, those connected with the manufacture of paper and printing machinery are the most extensive.

### QUESTIONS

Why were woolen and linen fabrics made in the United States so long before the manufacture of cotton was introduced?

Why has the manufacture of textiles in England and the United States reached its present development?

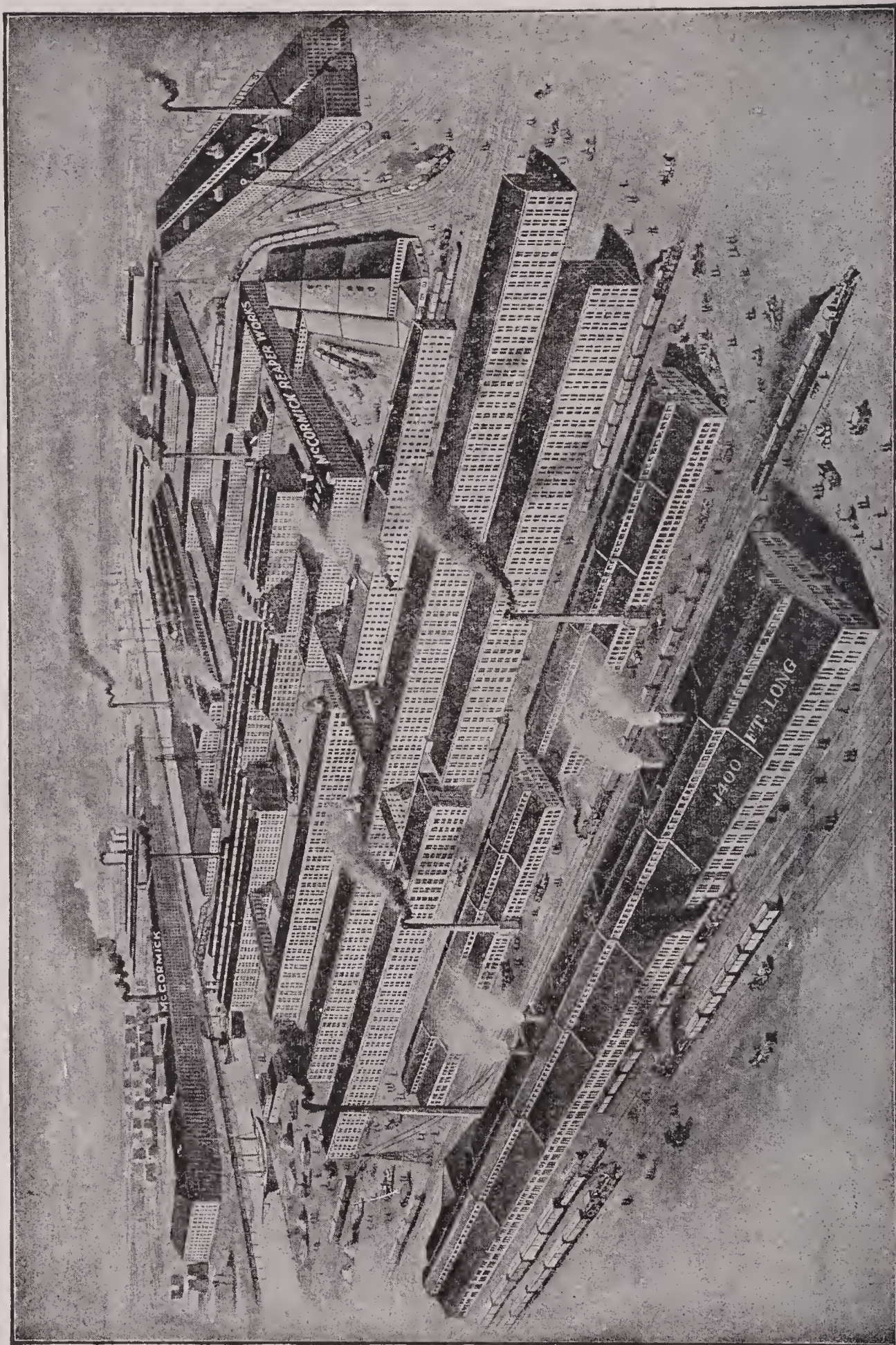
Why are cotton goods so much less expensive than woolens? Why are calicoes called "prints"?

Which are the more durable, cotton or linen goods?

Why is the manufacture of silk goods so extensive in the United States, when all the raw material has to be imported?

Why is so little linen manufactured in the United States?





MCCORMICK HARVESTER WORKS OF THE INTERNATIONAL HARVESTER COMPANY, CHICAGO.



## CHAPTER XIV

### OTHER INDUSTRIES

To describe all the manufactures of our country would require many volumes the size of this. While those already mentioned are among the largest and most important, there are scores of others of such magnitude that they could not be removed from our industrial or commercial life without causing a business stagnation. Some of these deal with large articles and require extensive establishments and much capital, such as the manufacture of agricultural implements and electrical appliances; while others deal with smaller articles and are conducted on a much smaller scale.

#### **AGRICULTURAL IMPLEMENTS**

The most important agricultural implements are those for preparing the soil for the seed, such as plows and harrows; those for planting, like planters and seeders; those for tilling the soil, such as the various patterns of hoes and cultivators; those used for harvesting, such as the mowing-machine, hayrake and tedder, the harvester and binder and the corn-cutter; and those used for preparing the crops for market, such as the threshing-machine, the corn-sheller or corn-thresher and the cotton-gin. To these must be added the innumerable hand tools, each of which is manufactured in large numbers.

The income from the manufacture of agricultural implements exceeds \$168,000,000 yearly. Illinois is the leading state and Chicago the leading city in the industry. Here are located the works of the International Harvester Company, which supplies most of the country with harvesters and mowers. On account of its lightness, durability and convenience, American agricultural

machinery is in demand in all of the agricultural countries of Europe and also in South America and Australia.

It is estimated by the Department of Agriculture that the inventions and improvements of agricultural machinery since 1860 have caused the following reduction in the cost of producing crops : corn, from  $34\frac{3}{4}$  cents to  $10\frac{1}{2}$  cents per bushel ; wheat, from  $17\frac{3}{4}$  cents to  $3\frac{1}{2}$  cents per bushel ; hay, from \$3.06 to \$1.29 per ton. At the present time the amount of human labor, on an average, required to produce a bushel of corn is 41 minutes, and for a bushel of wheat, 10 minutes.

This great saving in the cost of production has made it possible to sell the most important food products at such reduced prices as to bring them within the reach of all of our people. Agricultural implements touch the life of all classes and, directly or indirectly, affect the prosperity of all industries on account of the relation of these industries to agriculture.

#### **ELECTRICAL APPLIANCES**

Electricity has become a common agent in our industrial and commercial life. In addition to its oldest uses in the telegraph and telephone and electric light, it is now employed to propel cars and machinery, to separate metals from their ores and in the manufacture of numerous chemical products extensively used in the arts.

The demand for electrical appliances has become so general that their manufacture has created an extensive and important business. Factories for the manufacture of electrical machinery are found in all large cities. New York leads in the industry and Chicago is second, but smaller cities contain factories equally efficient, though operated on a less extensive scale.

#### **SMALL ARTICLES**

While the United States is the land of great achievements, and the twentieth century is the day of gigantic enterprises, we must not despise the small things which enter into our daily life. The country contains



numerous industries, which, when compared in value with those already described, are small, yet, on account of their relation to other industries and to commerce, are of such importance that, should any one of them be destroyed, its loss would cause serious inconvenience, both in the United States and several of the countries with which we are carrying on an extensive commerce.

**Gloves and Mittens**      Gloves and mittens are necessary for comfort and ornament. Every year there are manufactured in the country nearly 3,000,000 dozen pairs of leather gloves and mittens, to say nothing of those made of yarn and other material. The largest number is made in the state of New York, which has more factories than all of the other states combined. Illinois, Wisconsin and California are also prominent in the manufacture of these articles. Most of the leather used is kid, sheepskin and dogskin.

**Rubber Boots and Shoes**      The adaptation of the gum of the rubber tree to practical use is due to the inventive genius of an American, Mr. Charles Goodyear. After a number of years of trial it is said that Mr. Goodyear made his discovery by accident. The story is, that, after spending several years of his time and all of his property in trying to discover some means of hardening rubber so that it would not be sticky, he was one day engaged in an animated conversation with some friends who were in his shop. Upon a stove near which he stood was a kettle containing some rubber in a melted state, and with which he had mixed some sulphur. In the course of his conversation he upset the kettle and spilled the contents upon the hot stove. When the rubber and sulphur were raised to the required temperature, they united and formed the long sought compound. Mr. Goodyear obtained a patent upon his process in 1844, and the successful manufacture of rubber goods began that year.

Rubber boots and shoes have become a household necessity, and

their use saves thousands of people from exposure and discomfort. Most of the factories are located in Massachusetts, Connecticut, and Rhode Island. Chicago has a number, and there are a few others in different cities. But the rubber tires for automobiles far exceed in value the rubber boots and shoes manufactured in the country. The total output of rubber goods for 1916 was valued at \$550,000,000.

**Buttons** There are over 240 button factories in the country, and the yearly value of their combined product is some over \$20,290,000, which is quite a fortune to be expended on the production of so small an article. Buttons are made from more than a dozen different materials. The most important of these are agate, bone, glass, horn, vegetable ivory, pearl or shell, and metal, including nickel, steel, and brass.

What are known as fresh water pearl buttons are made from the shell of a clam which is found extensively in the Mississippi River and some of its tributaries. In 1890, this industry was unknown in the United States, but now it gives employment to several thousand people, and it has given value to a shell that before was considered worthless. The largest quantity of fresh water pearl buttons is made in the state of Iowa, where the industry started.

**Needles and Pins** Until the invention of the sewing machine but few needles were made in this country, but the necessity for machine needles led to their manufacture by sewing machine companies, and in time this manufacture was extended to include common needles. England leads the world in the manufacture of needles, and those of the best quality are still imported from that country.

Simple as this little implement is, the process of its manufacture is quite complicated. Even with all of the machinery now in use in their manufacture, every needle passes through the hands of seventy workmen before it is completed.



The pin also is an insignificant article, but one upon whose manufacture a great deal of forethought has been expended. Pins are made by machinery from coils of brass wire. The work is done so rapidly that a continuous stream of pins falls from the machine. Over 30,000,000 are made in the United States in every working day of the year. Before this work was done by machinery, each pin passed, in the course of its manufacture, through the hands of fourteen workmen. Centuries ago, pins were so scarce and so expensive that they were used only by the most wealthy people.

**Pencils and Pens** Although the use of the typewriter has become almost universal, millions of pencils and pens are used in the country every year. The great factories in which these are produced are in New York, New Jersey, and Pennsylvania. The graphite, from which the lead of the pencil is made, is taken from mines near Ticonderoga, N. Y., and the wood for the cases comes from the swamps of Florida. The United States manufactures about one-half a million gross a year.

Steel pens are made from cast steel of the best quality. Most of it is imported from England and Sweden. Some over a million gross are manufactured yearly, and to this must be added the gold pens and the various kinds of fountain pens. While England still leads in the manufacture of steel pens, the American factories now nearly supply the needs of our own country.

**Time Pieces** Most of the clocks of the country are made in Connecticut, and watches in Massachusetts, Illinois, and New Jersey. Accuracy and cheapness characterize the American watch. This is because the works are made entirely by machinery and are always exact. The largest watch factory in the world is at Waltham, Massachusetts, and the second in Elgin, Illinois. The Waltham factory alone manufactures more watches

in a year than any other foreign country except Switzerland, its output being 600,000.

Time-pieces are now so common that we scarcely think of their value until deprived of them, but this is because their manufacture has been made so cheap that almost anyone who desires may possess a clock or a watch. Before the manufacture of watches by machinery, their expense was so great that but few people could afford to own them.

**Waste By-products** Some of our most common articles in daily use are made from products that were formerly thrown away as worthless. Soap is made from the waste tissue and fat from the great meat packing houses. Glue comes from the heads and feet of slaughtered animals, and some of the most valuable fertilizers are made from the blood and offal.

Formerly, the slag formed in smelting iron was removed from the smelting works at considerable expense and destroyed; but now it is extensively used in making a valuable cement and in the production of paving stones. This industry is much more extensive in Europe than in the United States. The cities of Brussels, Metz, and Paris now contain a great deal of pavement made from slag. In England it is manufactured into bricks of a superior quality.

Sawdust has now become an article of value, when only a few years ago it was burned in the rubbish heap, or allowed to float down stream. By a process, discovered by a French cabinet-maker, the sawdust is made into an artificial wood by the use of cement, great pressure, and intense heat. The value of this wood is far greater than that of the natural timber. It is hard, strong, and capable of taking a high polish, so that the articles made from it are often more beautiful than those made from rosewood or mahogany.

The paper industry originally depended upon rags and waste



rope for its raw material, and it still consumes all of these that can be procured, but the source will not supply the present demand for paper, so that wood pulp and other material have to be added. But the use of these substances should not blind us to the fact that large quantities of rags and waste rope are used by the paper mills of the country.

The iron from old tin cans is fused into steel of good quality. The food waste and garbage of great cities, and even the grease obtained in cleaning wool, are all worked into something of use and value, and the fact that science and invention have made it possible to turn so many of these substances to practical use is one of the greatest importance in our industrial life. In all occupations economy and frugality are necessary to success, and nowhere do we find these virtues practised to a greater degree than in our great industrial enterprises, and this practice is one of the principal reasons for our success as a manufacturing nation.

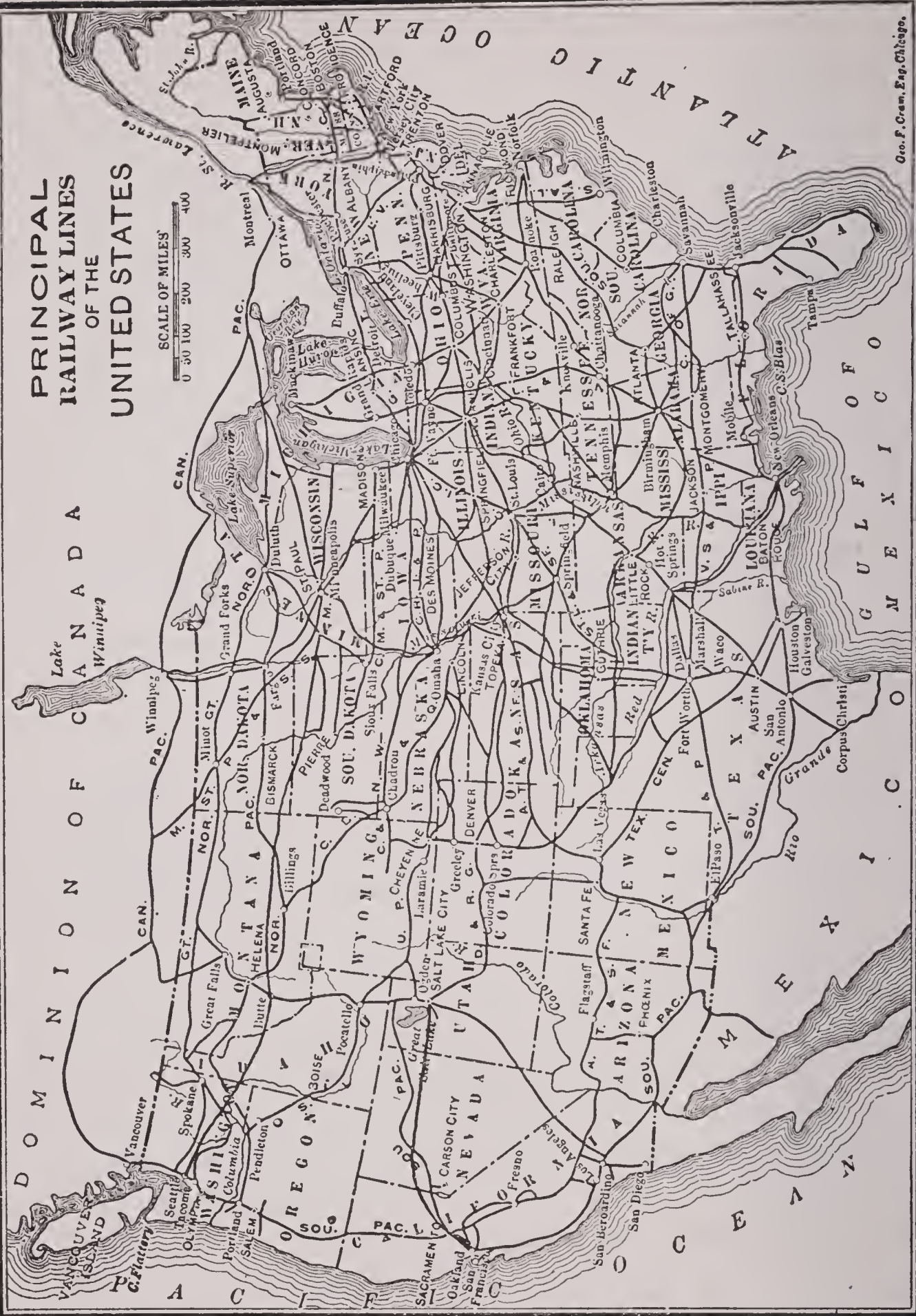
### **Automobiles**

Steam carriages were known in England and France before the Revolutionary War, but the

development of the automobile in its present form dates from 1884, when the perfection of the gasoline engine made such a vehicle possible. Since 1900, the use of automobiles has increased very rapidly. From a mere pleasure carriage the automobile has become a business necessity in both city and country. The auto truck is not only replacing the horse dray in cities; it is, on short hauls, competing in many places with the railroads in the transportation of freight. Moreover, farmers are using it for hauling their produce to market. The manufacture of automobiles and auto trucks is one of the great industries of the country. In 1921, there were about 8,888,000 in use in the United States, and the license fees for the preceding year amounted to \$102,000,000.

# PRINCIPAL RAILWAY LINES OF THE UNITED STATES

SCALE OF MILES  
0 50 100 200 300 400





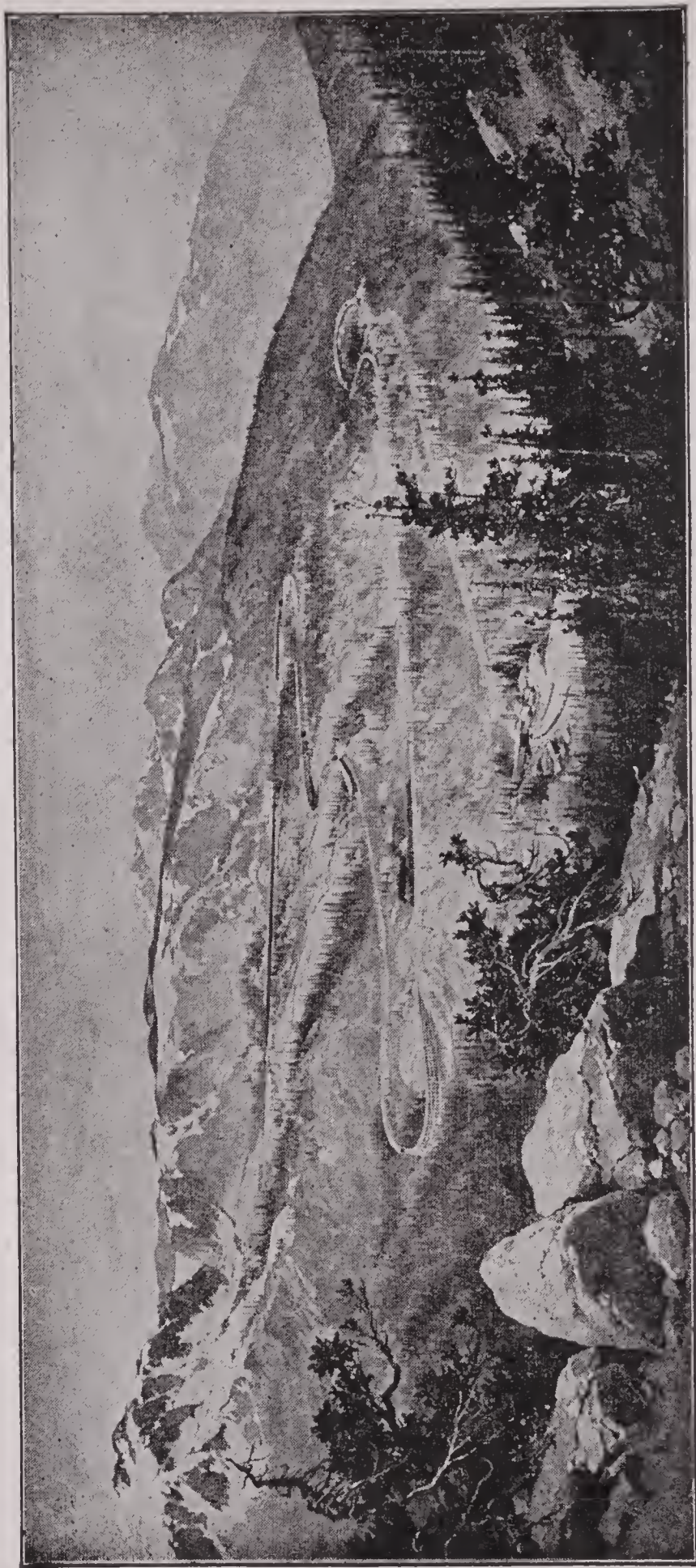
## CHAPTER XV

### TRADE ROUTES

**ROADS** When the country was new, all merchandise transported overland was carried on the backs of men or animals, and by boat whenever possible. The old overland trade route, in many instances, followed the most important Indian trails. These were located with reference to the ease and safety with which they could be traversed, or to their convenience in leading from one place to another.

The Indian trails became bridle paths, which joined neighboring settlements, and, as the country developed, these routes broadened into wagon roads. Previous to the Revolution, roads, over which stage wagons made regular trips, connected New York and Philadelphia; others connected Boston with some of the more important towns in Connecticut, and these towns with New York. However, but little attention was given to road making until after the war for independence.

Road making in the United States has not kept pace with the commercial development of the country on account of the vast extent of our territory and the rapid settlement of new states. In the older states the principal roads are fairly good, but in those west of New York and south of the Ohio River the roads are entirely inadequate to the demands made upon them. In all of these states there are but a few miles of stone road, and in certain seasons the dirt roads are well nigh impassable on account of mud. The growth of the country and the rapid development of our commercial interests make good roads a necessity to all agricultural communities, and both the national and state governments are now



A RAILROAD LOOP IN THE ROCKY MOUNTAINS

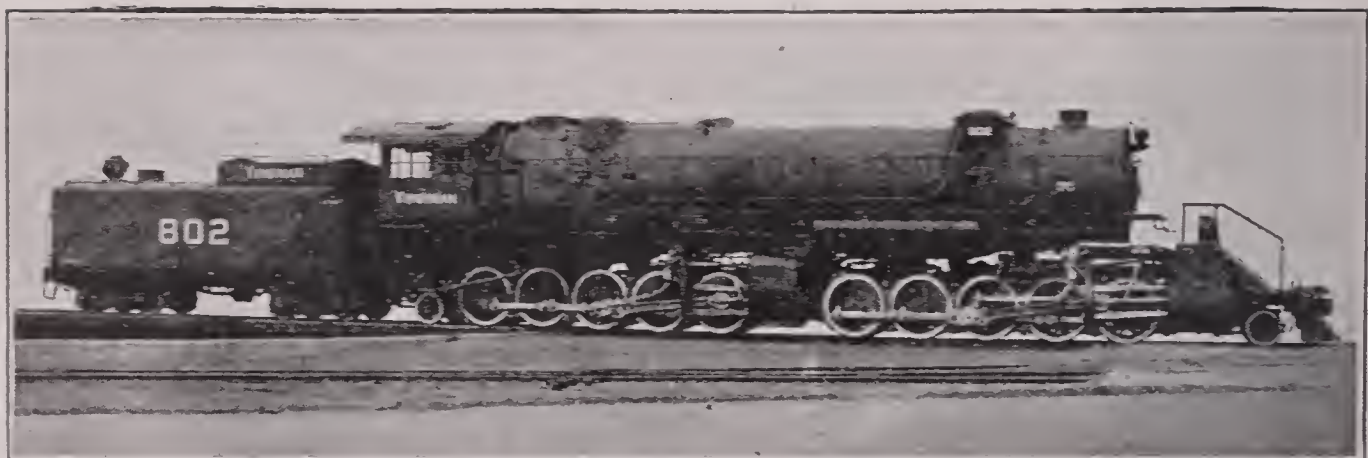


making large appropriations for the improvement of public highways. Skillful engineers are employed in laying out and grading the roads and gravel, cement, asphalt and other preparations are employed for surfacing.

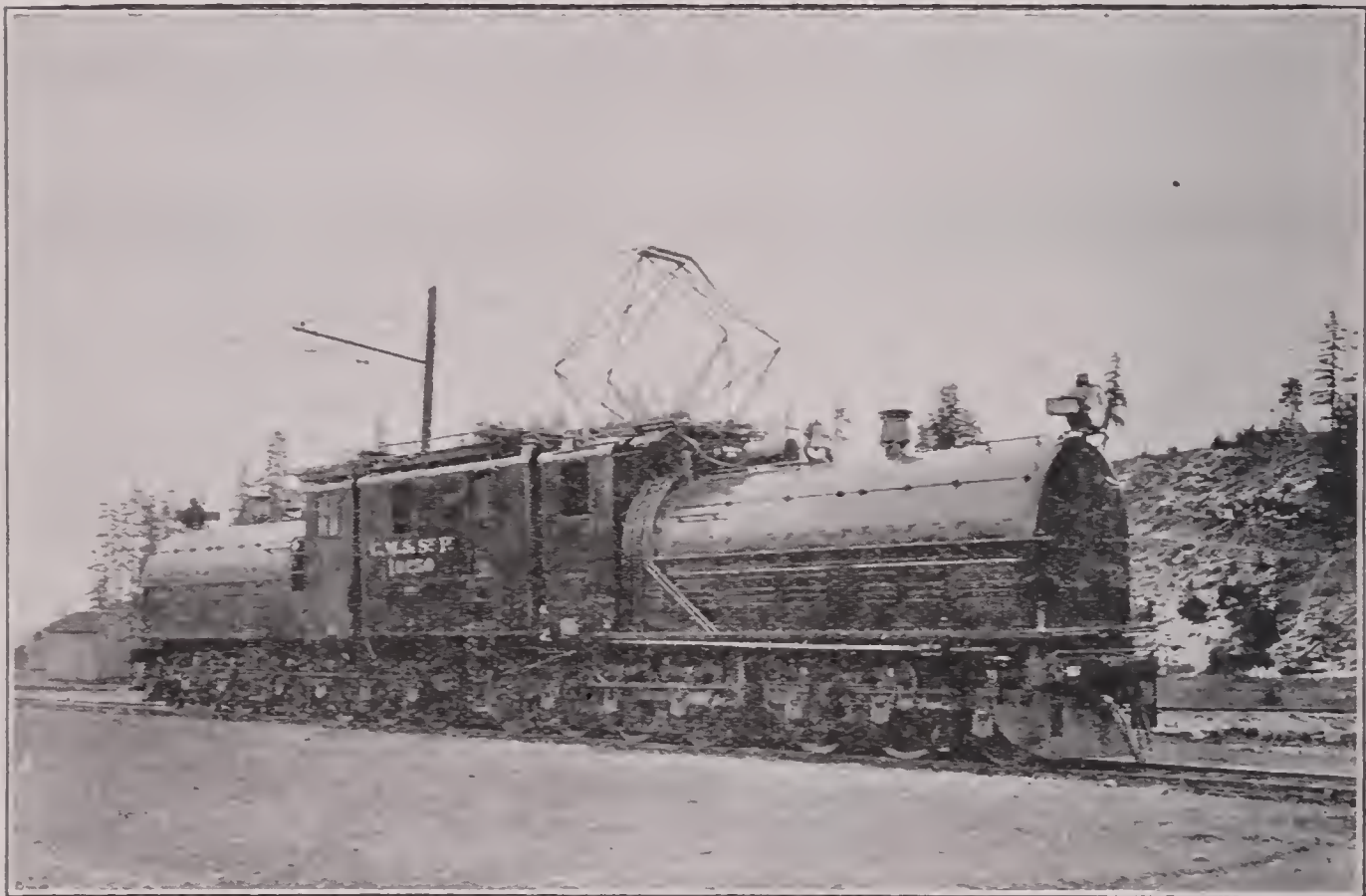
**RAILROADS** Railroads are the greatest overland trade routes of the country. Beginning with the construction of the Baltimore & Ohio and the Delaware & Hudson Canal Roads in 1830 and 1832, they have gradually extended their lines until now railways are found in nearly every habitable portion of the land. The first railway lines followed the river valleys, and for many years it was not thought possible to construct a railroad through mountainous, or even hilly regions, but the science of engineering has now overcome all difficulties; impassable mountains are tunnelled, rivers and lakes are bridged, and a railroad can be constructed wherever it is desired, provided the company is willing to pay the cost.

We should notice here that tunnelling a mountain or bridging a stream has the same effect as removing these obstructions, as far as transportation is concerned. The most important tunnel of this sort is the Hoosac Tunnel in Massachusetts, which is some over four miles in length. Numerous others of greater or less length are found in the Appalachian and Rocky Mountains. The great rivers of the United States and Canada are now bridged in numerous places. Some of the most noted of these bridges are the Eads Bridge, crossing the Mississippi at St. Louis; the railway bridges crossing the Ohio at Cairo, Ill., and Louisville, Ky.; the steel-arch bridge across the Niagara River at Niagara Falls and the great cantilever bridge at the same place. Numerous other important bridges also exist, but to enumerate them all would make a list too long for a work of this size.

In numerous places, where, on account of the breadth of the body of water or the danger of obstructing navigation, bridges are



LARGEST PASSENGER LOCOMOTIVE IN THE WORLD (1923)



LARGEST ELECTRIC LOCOMOTIVE IN THE WORLD (1923)



impracticable, ferry boats are employed to transport trains across. These ferries are large steamboats constructed especially for this purpose, and most of them are capable of carrying from ten to twenty-four cars at once. Some of the most important railway



ICE-CUTTING RAILWAY FERRY

This ferry is 302 feet long and can carry 18 freight cars at a load. It plies between St. Ignace and Mackinaw City, Mich. A special device for cutting the ice enables it to keep the channel open the entire winter.

ferries are those crossing the East River at New York, the Detroit River at Detroit, and Port Huron; those crossing the Ohio River at Cairo, Ill.; those crossing the Straits of Mackinaw between St. Ignace and Mackinaw City, Mich.; and those crossing the bay at San Francisco. The boats crossing the Straits of Mackinaw are

of a peculiar style and are so constructed that they can cut their way through the ice during the winter. These boats are among the largest railway ferries in the world. There are also a number of ferries plying between Milwaukee and ports on the eastern shore.

The most important lines of railway extend east and west, or nearly so. There are, however, a few exceptions to this general rule. The lines in the northern New England States, and many of those in the Southern States, extend north and south, while the Illinois Central extends from Chicago to New Orleans and forms an important north and south trunk line. This railway has numerous branches extending from Chicago to St. Paul, from Chicago to St. Louis, and numerous shorter lines which connect the main line with other important towns on the Mississippi.

The railways of the United States are naturally grouped according to the extent of their lines and their connections, as follows:

**The New England Group** The railways of the New England States belong almost entirely to the Boston and Maine, the New York, New Haven and Hartford, the Maine Central, and the Grand Trunk Systems. The main lines and branches of these combined systems touch almost every town of importance in the states through which they pass. Their principal connections with western lines are made at Albany, N. Y., New York City, and Montreal. The important railway centers in the New England States are Portland, Maine, Boston and Springfield, Mass., and New London and Hartford, Conn.

**The Central Group** The railroads in this group are arranged in two divisions: those running from eastern points to Chicago, and those running from Chicago westward. The important lines of the first division are the New York Central and Hudson River Railroad running from New York to Buffalo, and its extensions, the Lake Shore and Michigan Southern and the Michigan



Central, both of which reach from Buffalo to Chicago; the Pennsylvania System, also extending from New York to Chicago, by way of Philadelphia, and having many important branch lines leading to Columbus, Cincinnati, Fort Wayne, and numerous other important towns in Ohio and Indiana; the Baltimore and Ohio, extending from New York to Baltimore and Washington, thence westward by the Potomac and Ohio Rivers as far as St. Louis, with a northern line by way of Harrisburg to Chicago. Other important lines in this group are the Wabash and Pacific, the Lake Erie and Western, the Chicago, Cleveland, Cincinnati and St. Louis, usually known as the Big Four.

The important lines of the second division are, the Chicago and Northwestern, with lines extending from Chicago to St. Paul and Minneapolis, from Chicago to Duluth, Chicago to Omaha, and branch lines extending into Iowa and South Dakota; the Chicago, Milwaukee and St. Paul, extending from Chicago to St. Paul by way of Milwaukee, and with important branches running through Northern Illinois, Iowa, and Southern Minnesota; also the Chicago, Burlington and Quincy, usually known as the Burlington System. This system has important lines extending from Chicago to St. Paul, and St. Paul to St. Louis, with a line to Denver by way of Kansas City. It will be noticed the roads leading out of Chicago in many instances extend beyond the Mississippi. They form the connection between the roads of the first division in this group and the great trunk lines which extend from the Mississippi and Missouri River points to the Pacific coast.

The most important railway centers in the central group are New York, Albany, Philadelphia, Baltimore, Pittsburgh, Buffalo, Cincinnati, Fort Wayne, South Bend, Chicago, and St. Louis.

**The Western Group** This group contains those systems which form the great transcontinental lines, so called because they make connections which reach across the coun-

try, though no one road or single system of roads in the United States has a continuous line from the Atlantic to the Pacific. These lines are, taking them in their order from north to south, the Great Northern and Northern Pacific, extending from St. Paul and Duluth through Minnesota, North Dakota, Montana, and Idaho to points in Washington and Oregon; the Chicago, St. Paul and Puget Sound; the Union Pacific, extending from Omaha, through Nebraska, Wyoming, Utah, and Nevada, to California points; the Atchison, Topeka and Santa Fé, extending from Chicago to San Francisco by way of Colorado, New Mexico, and Arizona; and the Chicago, Rock Island and Pacific, which also is a route extending westward from Chicago through Colorado and Arizona to California. Of these, the Union Pacific, now generally known as the Southern Pacific, was the first line constructed, and its completion in 1869 marked the beginning of a new industrial era in the country. All of these great lines have received government aid in their construction, in most cases by large grants of land which the roads have sold to settlers, but in some cases, particularly that of the Union Pacific, by the government guaranteeing the bonds issued for the construction of the road.

The great railway centers connecting with this group of roads are Chicago, St. Louis, St. Paul, and Minneapolis, Omaha, Kansas City, Denver, San Francisco, Portland, and Seattle. It will be noticed that Chicago is in the territory of the central group, but it is practically the center from which all these great lines radiate and properly belongs with them on account of this relation.

**The Southern Group** The roads of the southern group are less extensive than those of the others, but most of them are now combined into systems. Among these worthy of mention are the Chesapeake and Ohio, the Queen and Crescent, the Atlantic Coast system, the Louisville and Southern, the Georgia Central, and the Illinois Central. The most important of



these lines have direct connections with the lines of the Central Group at Cincinnati, Cairo, and St. Louis. The important railway centers are Louisville, Nashville, Atlanta, New Orleans, and Jacksonville.

The United States has some over 264,000 miles of railways, which is over one-third the mileage of the world. Most of the lines are combined into great systems, each of which is under a single management. The largest of these is the Pennsylvania, which includes some over 11,200 miles of track. Others of importance are the New York Central, the Chicago and Northwestern, the Santa Fé, the Chicago, Milwaukee and St. Paul, the Burlington, and each of the great Pacific lines. The combined roads have over 65,000 locomotives, 53,000 passenger cars, and about 2,325,000 freight cars. They carry yearly nearly a billion passengers, and about two billion tons of freight, and employ over a million men. The capacity of the freight cars ranges from thirty to forty tons. The speed of the passenger trains is from forty to fifty miles, with a speed of from sixty to sixty-five miles per hour for some of the fastest express trains. Through freight trains average about thirty miles an hour, except in mountainous regions. The average tariff per mile for passengers is a little over three cents, and the freight rates are about eighty-five cents per ton for each hundred miles.

### **INLAND WATERWAYS**

The inland waterways of the United States have an extent of about 26,000 miles, as follows: navigable rivers, 14,000 miles; canals, 4,000 miles; lakes, 8,000 miles.

### **Rivers**

The most important navigable rivers belong to the Mississippi system, and are the Mississippi, the Ohio, the Missouri, the Arkansas, and the Red, with a few smaller tributaries.

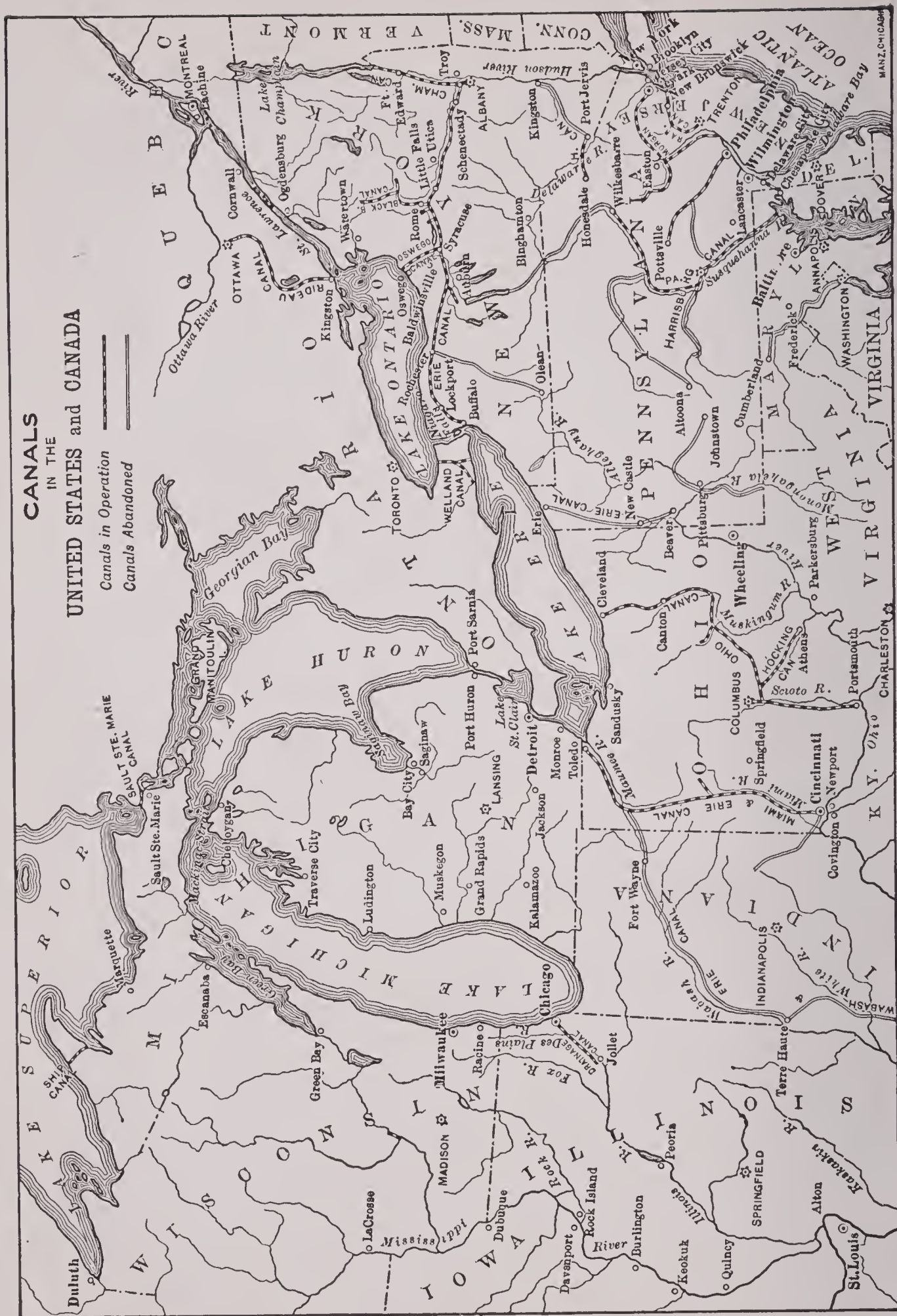
The Mississippi is navigable as far as St. Paul, and between St. Louis and the Gulf has numerous lines of steamers making

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**CANALS**  
IN THE  
**UNITED STATES and CANADA**

Canals in Operation

Canals Abandoned

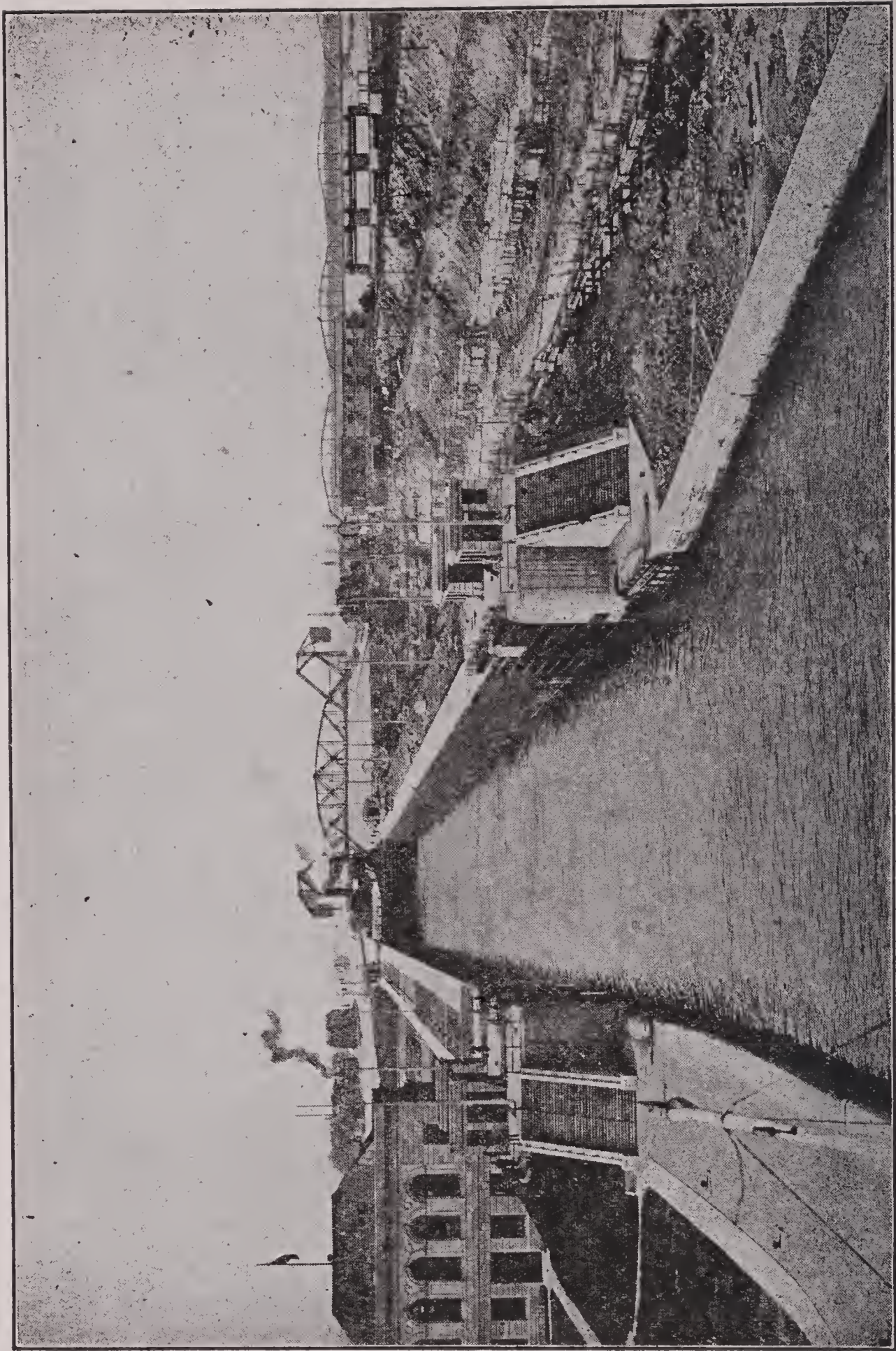




regular trips throughout the year. The Ohio is navigable as far as Pittsburgh, and furnishes a very important outlet for the coal, iron and other heavy products of that part of the country. The Missouri is navigable as far as Fort Benton during high water, and to the mouth of the Yellowstone at other times, but the construction of the western trunk lines of railway has made the navigation of this stream of less importance than formerly. Most of the rivers of the Atlantic Slope are navigable to the fall line, and steamers ascend the Hudson as far as Albany. Navigable rivers afford convenient transportation at lower rates than those charged by the railways and those of the Mississippi system are of special value because of their length and the means they afford of reaching points far removed from the sea coast.

**Lakes** The most important lake routes are those connected with the Great Lakes. They include routes from Duluth to Lake Huron points, such as Port Huron and Detroit, and to Cleveland and Buffalo, and other ports on Lake Erie; also routes from Chicago, Milwaukee, and several Michigan points, through the Straits of Mackinaw to the ports of Lake Huron and Erie. The railroads of this section have some advantage over the lake routes, because the latter are open to navigation only 225 days in the year, while the railroads are open the year round; but the cheap transportation offered by the lines of steamers plying over these waters gives them an abundance of traffic during the open season. During the season, lake steamers, drawing 20 feet of water, and as large as many ocean steamers, make regular trips between Duluth and Chicago. The best of these boats can make 14 to 20 round trips from the first of May to the first of December. On their downward trips, boats, from Duluth and Lake Superior points, carry cargoes of grain, copper, flour, and iron-ore; from Chicago and Lake Michigan points, grain and merchandise; on their return trips about one-fourth of all boats are usually loaded with coal or

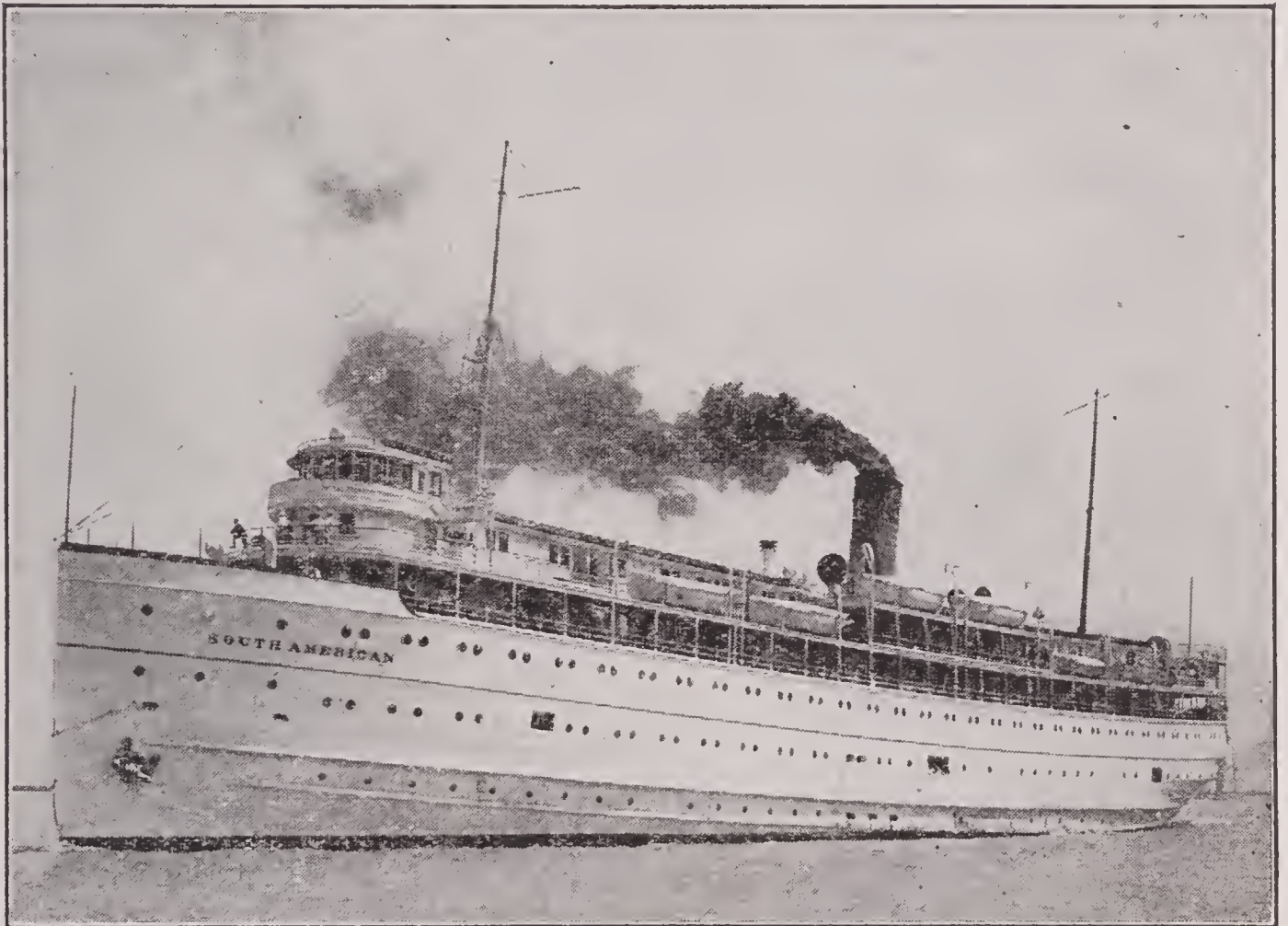




LOWER APPROACH TO THIRD LOCK, KNOWN AS THE DAVIS LOCK, AT SAULT STE. MARIE, MICHIGAN  
View from Approaching Vessel



merchandise. Some lines carry both freight and passengers and two lines are devoted entirely to passenger traffic. The trip is one of the most delightful in the world.



THE "SOUTH AMERICAN."

(One of the Steamers of the Chicago, Duluth and Georgian Bay Steamship Company)

**Canals** Lake and river routes are greatly extended by systems of canals. The Erie Canal, extending from Buffalo to Albany, N. Y., and connecting the Great Lakes with the Hudson River, was completed in 1825. It was the first great public work undertaken by the United States and its opening marked a new era in the industrial and commercial progress of the country. In 1913, the legislature of New York voted to combine the Erie

Canal with the Champlain, the Oswego, and the Cayuga and Seneca Canals and give the system the name, New York State Barge Canal; \$100,000,000 was appropriated for enlarging the entire system, and the work was nearly completed in 1916. This canal provides the state with 790 miles of waterway broad enough and deep enough to carry 1500-ton barges. The construction of the Erie Canal gave New York its supremacy as a commercial center.



The St. Mary's Canal at Sault Ste. Marie, Mich., is the most important short canal in the world. It is about a mile long and provides for a drop of about 20 feet, to enable vessels to pass around the rapids in the St. Mary's River. The American locks are four in number, and are situated side by side. The two largest are 1350 feet long, 80 feet wide and have  $34\frac{1}{2}$  feet of water over the sill. The Poe lock, next in size, is 1000 feet long and 100 feet wide and

has 21 feet of water over the sill. The fourth lock is used for small boats. The lock on the Canadian side is a little larger than the Poe lock.

About 25,000 vessels pass through these locks during a season, which is more than six times the number passing through the Suez Canal. The other canals connected with the lake routes are in Canada, but are so closely associated with the traffic of the United States, that they really belong to this system of water routes. These are the Welland Canal, which connects Lake Erie with Lake Ontario and passes around the falls in the Niagara River, and the system of canals around the rapids in the St. Lawrence. The



combined length of these canals in the St. Lawrence is about 44 miles, while the total length of the canals between Lake Superior and Montreal is about 70 miles. By their means ocean-going ships of small size and draft can pass from the lake ports to the Atlantic and return without difficulty.



WHALEBACK COMING OUT OF THE POE LOCK AT SAULT STE. MARIE  
The power-house, containing the machinery for operating the locks, is on the left.

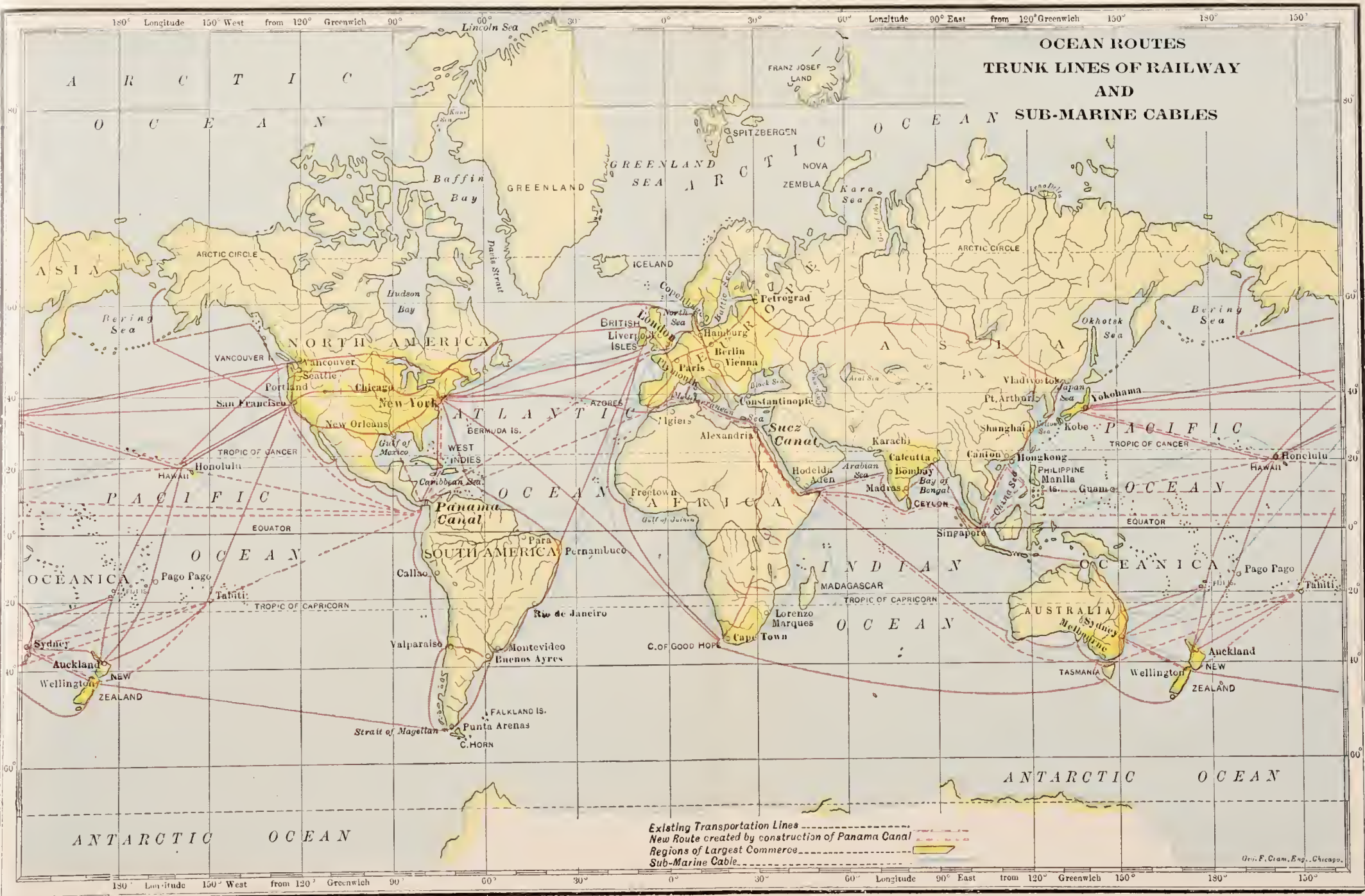
A number of canals were constructed, connecting Lake Erie with the Wabash and Ohio Rivers, passing across the state of Ohio by way of Columbus and Cincinnati; but the numerous lines of railway now traversing that state have rendered them almost useless, except for the carrying of coal and ore. A canal around the falls in the Ohio at Louisville enables boats to pass around this obstruction so that freight can be carried from Pittsburgh to the Mississippi without reloading.





AN OCEAN LINER





OCEAN ROUTES  
TRUNK LINES OF RAILWAY  
AND  
SUB-MARINE CABLES

Existing Transportation Lines  
New Route created by construction of Panama Canal  
Regions of Largest Commerce  
Sub-Marine Cable

Gen. F. Cram, Eng., Chicago.





Another canal of some importance is that connecting Lake Champlain with the Hudson River. There are a few small canals in Pennsylvania, and the old Chesapeake and Ohio Canal in Maryland is still used for carrying coal, but aside from the Erie Canal, and those connected with the navigation of the St. Lawrence, most of these waterways have fallen into disuse.

The Chicago Drainage Canal, extending from Chicago to the Illinois River at Joliet, though originally constructed for drainage purposes, is of such dimensions as to make it navigable for the largest lake steamers. By deepening the Illinois River at various points, and making the proper connection between it and the canal, a direct water route from Lake Michigan to the Gulf of Mexico can be secured, and it is probable that the government will undertake this work in the near future.

### OCEAN ROUTES

The most important Atlantic routes extend from New York, Boston, and Philadelphia to the ports of Europe, and southward along the coast to some of the gulf ports, the West Indies and Central America. Vessels formerly going around Cape Horn to reach ports in the Pacific Ocean now go via the Panama Canal. These routes are marked on the map, and each should be carefully traced. Vessels going eastward take a northerly route and avail themselves of the Gulf Stream, escaping the trade winds which blow towards the west; while those vessels going westward, especially sailing vessels, follow the route which is in the path of the trade winds and receive what benefit they can from them on their voyage. However, the great ocean liners which make the highest speed between American and European ports, pay but little attention to either winds or currents, but follow the route which covers the shortest distance between ports.

The Pacific routes lead from San Francisco and Seattle to the westward. These extend to the Hawaiian Islands, the Philippine Islands, and the ports of China and Japan, while the coastwise

routes extend northward to Alaska and southeast to the ports on the Isthmus of Panama, and the coast of South America. The annexation of the Hawaiian Islands, the development of the Philippines, and our increasing trade with China and Japan are making the Pacific routes more important every year. (See page 290.)

### AN OCEAN LINER

One who has not crossed the Atlantic has little conception of the size and conveniences of one of the great steamships that ply between European and American ports. For a number of years builders have been constructing very large ships for the steamship companies. One of these, the *Mauretania*, of the Cunard Line, is about 790 feet long. Were seven ships of this length placed end to end they would extend over a mile. The smokestacks are taller than the spires of many churches, and if laid in a horizontal position two railway trains could pass through them abreast on double tracks.

When fully loaded the *Mauretania* displaces 46,000 tons of water, a quantity sufficient to fill a channel 30 feet wide, 6 feet deep and one and one-half miles long. She makes the trip between New York and Queenstown in a little less than five days.

The three largest ships completed previous to 1916 were the *Imperator*, 909 feet long; the *Vaterland*, now the *Leviathan*, 950 feet, formerly of the Hamburg-American Line. The *Leviathan* is 100 feet wide, has a hold 65 feet deep, and engines of 80,000 horsepower. Her speed is 24 knots an hour, two knots less than that of the *Mauretania* of the Cunard Line. Over 1000 tons of coal are consumed daily in driving the engines of one of these great ships. These great ocean liners are in every respect floating palaces. They contain electric passenger and freight elevators, play-rooms for children, swimming-pools, and every luxury found in the finest hotels of Europe and the United States.



**SHIP CANALS**

Canals are constructed to enable boats to pass around obstructions, like falls or rapids in a river, or to shorten distances between points. The Welland Canal in Ontario is a good illustration of those constructed for the first purpose. This canal overcomes the difficulty presented by Niagara Falls. The Kiel Canal, connecting the Baltic and North Seas is a good illustration of a canal constructed for the second purpose. Cape Cod Canal shortens the distance between Boston and New York and other southern ports by seventy miles. The Suez Canal connecting the Mediterranean and Red Seas is 100 miles long, 400 feet wide, at its surface and 31 feet deep. Its construction completely changed the ocean routes between Europe and the East. By passing through the Suez Canal, and the Red Sea, ships bound from European ports to India, China and Japan save over 4000 miles.

The Panama Canal, opened for traffic in 1914, is the most important ship canal in the world. It has shortened the distance by water between New York and San Francisco and other United States ports on the Pacific coast 7800 miles and the distance between New York and the Pacific ports of South America 4000 to 5000 miles. It has cut 5000 miles from the distance between Liverpool and the Pacific ports of South America and many ships formerly passing through the Strait of Magellan now make use of the Panama Canal.

**COMMUNICATION**

Of almost equal importance with the lines of transportation are the means of communication by which business men are kept constantly informed of the industrial conditions and the state of the markets of the entire world. Without the telegraph and the telephone it would be impossible to operate our great railway and steamship lines upon present plans. Telegraph lines now traverse the entire country in all directions, and there is scarcely a hamlet which is not within easy reach of a telegraph office. In addition to this, ocean cables now cross the Atlantic and Pacific, so that it is possible to send a

dispatch to any part of the world and receive a reply within a few hours' time, and wireless messages across oceans and continents are now common. Telephone lines extend from large cities to surrounding towns, and even to many rural communities, so that these places have a cheap and easy means of communication with the great centers of trade.

In addition to these means of communication, the mails transmit promptly and cheaply letters, bills, receipts, drafts, and money orders, and what is of almost equal importance, numerous newspapers and trade journals, by means of which every business man can obtain reliable and very complete information of those lines of commerce in which he is interested. Besides, most localities are now favored with free rural delivery, by which means mail is brought daily to every resident along the route.

### QUESTIONS

In what general direction did the earliest railroads in the United States extend? In what direction do the longest trunk lines now extend?

What has made Chicago the largest railroad center in the world?

In what way has the government aided in the construction of railroads? Has this aid been beneficial to the country?

Why did the completion of the Erie Canal form the beginning of a new era in the commercial history of the United States?

In what way does the government aid in transportation?



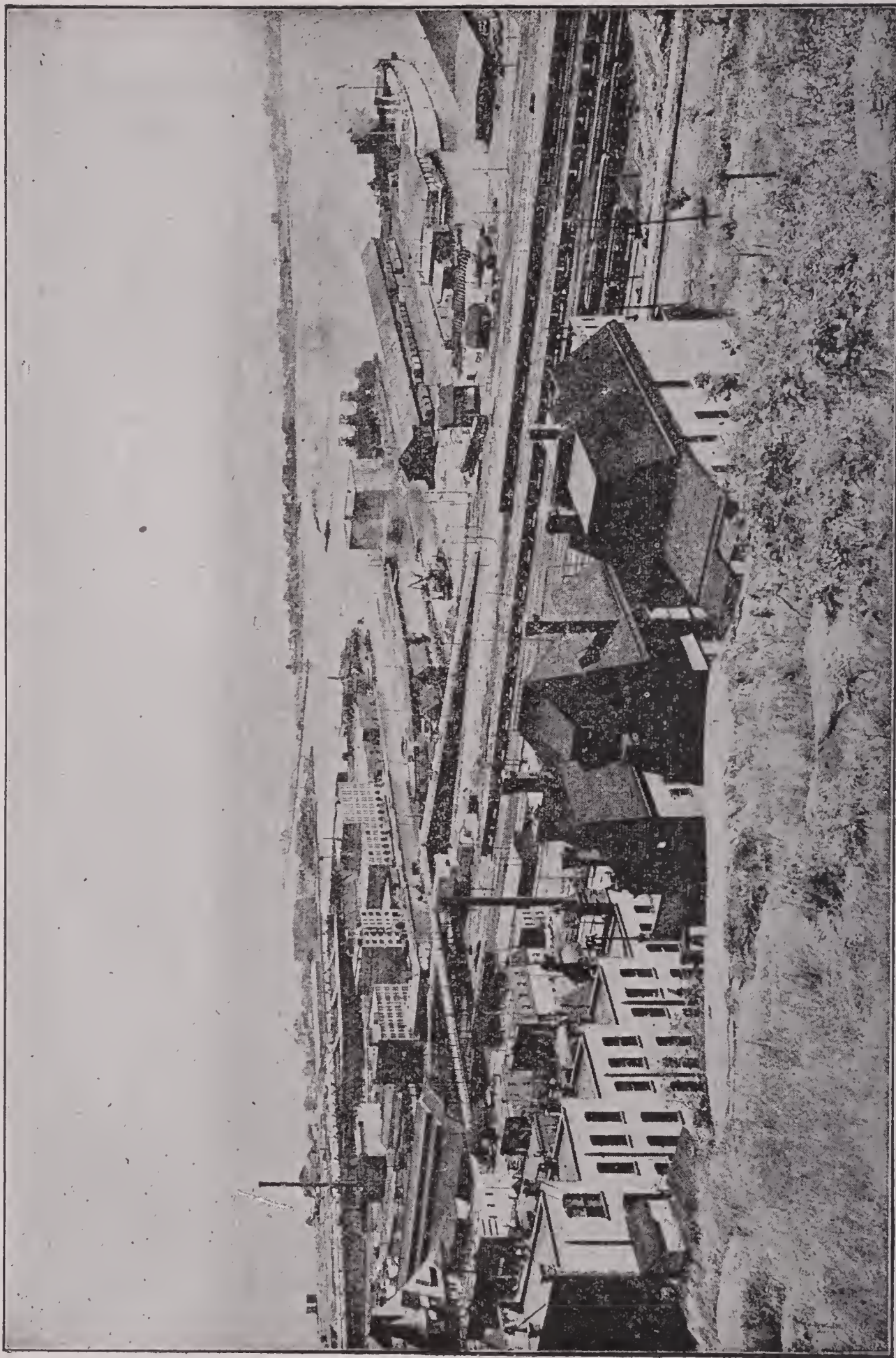
## CHAPTER XVI

### GREAT CITIES

**LOCATION**      The early history of most of our large cities might lead one to think that their beginnings were accidental, and while it is difficult to say why some cities are located just where they are, it is, nevertheless, a well-recognized fact that the location of most was determined by geographical conditions. Some are dependent upon one set of conditions and others upon another. Among the most important of these are the following :

**Good Harbors**      Transportation by water is successful only when vessels have safe and convenient anchorage; consequently, those towns which were first built on enclosed arms of the sea, having a sufficient depth of water to admit the largest vessels, possessed great advantage in trade. Ships sought their ports and people from other towns and the surrounding country came to them to exchange commodities. This gave employment to a large number who must necessarily live near their work, and thus the city was started. One line of business attracted another and the city continued to grow. On the Atlantic coast, Boston, New York, Philadelphia and Baltimore are the best illustrations of cities built on good harbors, and San Francisco and Seattle, on the Pacific, owe their prosperity to a similar cause.

**Convenient Meeting Places**      Many country towns began from apparently trivial causes. They were convenient stopping places at the end of a day's journey, or where a road had to cross a river by a ford or a ferry. People could meet at such places more conveniently than at any other place in the vicinity, and trade sprang up. As the population



HARBOR, DULUTH



increased, business was extended, requiring more people, and the settlement became a town. In certain localities, such towns often grew into cities. A number of our small inland cities started in this way.

**Water Power** Many of the cities of the New England and the North Atlantic States are built on sites where water power is abundant. Such are Lowell and Fall River in Massachusetts; Nashua, N. H., Troy, N. Y., and a number of towns on the fall line; while Minneapolis illustrates the same principle of location in the Mississippi Valley.

**Military Stations** In our early history, many military posts were established at junction points and portages. These were found to be safe and convenient places for trading stations, and business was drawn to the localities where they were established. When the military was removed, the trading post remained and grew into a town and then to a city. Detroit, Chicago and St. Louis are illustrations of cities that began as military posts.

**Mining** Pittsburg owes its growth and prosperity to the presence of coal and iron, which made it a convenient and cheap manufacturing center. Added to this was its advantage of being at the head of navigation on the Ohio, which, before the extension of railroads into the interior of the country, gave it prestige as a trading center. Many cities in the coal regions of Pennsylvania, Leadville, Colo., Butte, Mont., and a number of other thriving cities owe their growth to mining interests.

**Meeting Places of Land and Water Routes** A number of inland cities have grown up at convenient meeting places of land and water routes. Duluth affords the best connection for the railroads of Northern Minnesota and North Dakota with the steamers on the Great Lakes. While Buffalo affords an equally convenient place for

such connection at the lower end of the lakes. Besides, the construction of the Erie Canal early gave this city an important position as a place of trans-shipment of cargoes from lake vessels to the canal boats. Cleveland, Detroit, Milwaukee and Chicago each owe much of their prosperity to similar causes. Numerous lines of railway meet in each of these cities, and the traffic between them and the lake steamers is extensive. New Orleans is an important port for the trans-shipment of cargoes from the Mississippi steamers to ocean-going vessels and from these vessels to the river steamers.

**Railway Centers** Some inland cities owe their prosperity to the fact that they were located at a convenient point for numerous railways to meet. Indianapolis, South Bend and Denver are good illustrations of such centers.

**Other Causes** There are a number of other causes which have led to the building of cities at numerous points. St. Paul is at the head of navigation on the Mississippi, and Albany is similarly situated on the Hudson. New Orleans occupies a good site for a river port near the sea. The building of the Eads Bridge transformed East St. Louis from a small town to an important city and railroad center. The construction of a bridge across the Missouri at Kansas City also contributed much to that city's growth. The consolidation of manufacturers and other industries under great corporations that erect extensive factories also contributes to the growth of many cities, and causes the foundation of others. These plants require thousands of workmen, all of whom must live near their work, consequently houses are built near the factories, the wants of the people bring other industries and a town is soon established.

**PLAN OF A CITY** While each city has its own peculiarities of structure which are determined by its location, in their general plan all American cities are similar.



**Outline** The outline of a city is determined almost entirely by its site. Boston occupies land surrounding a very irregular body of water, and has the most irregular outline of any large city in the country. New York originally occupied an island and conformed to its contour, and in its extension has kept its form intact, so that the city is an approximate rectangle, with its greatest length from north to south. Since the west side of the city is bounded by the Hudson, its outline is regular; but the extension of the city eastward is greater in some places than in others and its eastern boundary is quite irregular. Philadelphia follows the Delaware and Schuylkill, which gives it quite a long extension on the west side. Chicago is a rectangle, with its greatest length on Lake Michigan, and inland cities, whose sites are not affected by bodies of water, are generally regular in outline.

**Plan** In a great measure the streets of a city must conform to the shape of the site. Cities built upon an irregular site cannot have streets as regularly laid out as others; new cities are more regular than old ones. Philadelphia was the first American city whose streets were properly planned. They run at right angles and are so numbered that the number of any building at once tells its location. This is the proper method of laying out the streets and numbering the lots, and is pursued in all the newer cities of the country.

The modern method of laying out a city is to run the streets at right angles, if possible; to name those running in one direction and number the cross streets. Usually an important street through the center of the city is taken as the line from which the numbers extend either north and south or east and west, as the case may be. The blocks are numbered by hundreds; all of the numbers in the first block running from one to one hundred; those in the second from two hundred to three hundred, and so on. By this method, one acquainted with the city can immediately tell the location of

the building. Formerly the lots were numbered in regular order, from end to end of the street, without regard to the number of blocks. Unfortunately in some cities both methods of numbering are in use, which makes it impossible to determine location by number.

Every city is divided into a number of well defined portions, each of which is distinguished by some leading feature. Except in mining towns, the shipping portion is first determined upon. If the city is on a navigable body of water, this is where the most convenient and commodious harbor can be made. In large sea and lake ports it often extends for a long distance along the water front and where the city is at the mouth of a navigable river, the shipping portion may also extend along both banks for several miles, as in Chicago. If the city is a railway center, the shipping portion is in the locality where commodious railroad yards and freight houses can be most conveniently and economically erected. In large cities the industries often exert a strong influence in locating shipping portions, and instead of one there may be several.

The manufacturing portion is always situated as near the shipping portion as possible, in order to save unnecessary expense in transportation. Cities having an extensive shipping business may have more than one shipping portion, but in such cases, industries of the same sort have a tendency to seek the same locality, therefore we find furniture factories in one locality, boot and shoe factories in another, and iron foundries and machine shops in a third.

As near as possible to the shipping and manufacturing portions is the exchange, or "downtown" portion. This is usually the most important part of the city, and is divided into wholesale and retail districts, the former being near the shipping portion. Here, in addition to the wholesale and retail stores, we find the large office buildings and most of the public edifices, as the post-office, city hall, court-house and such other similar institutions as the city





THE CUSTOM HOUSE, BOSTON

(Photo copyright by H. A. Folsom)

may contain. In some cities public libraries are located within the business portion, while in others they are in more retired sections. Conveniently located to all business enterprises are found a number of banks, and sometimes a United States sub-treasury office. The buildings in the exchange portion are large, and, in such cities as New York and Chicago, very tall, some of them exceeding thirty stories in height. The streets are broad, and so paved as to enable them to withstand the heavy teaming.

The residence portions are situated around the other portions of the city, and to be desirable should afford good drainage, plenty of sunlight and fresh air, and be interspersed with boulevards and parks. The portions vary widely in these respects, and each portion is sought by the class of people to whose means and tastes it is best suited. Some sections are occupied by those who have acquired great wealth. These sections are characterized by expensive residences, beautiful streets, and numerous parks; other sections are occupied by people who, though in good circumstances, do not care to live in so expensive a style. In these sections are many large apartment houses divided into "flats." The portions occupied by the poorer classes are usually quite near, if not within, the manufacturing or exchange centers, and are densely crowded. In such cities as New York and Chicago various localities in the residence portions are occupied wholly by people of foreign extraction who have emigrated to this country and still maintain the language and customs which they used in their fatherland.

The transportation of the inhabitants to and from their places of business always has been a serious problem, and as the cities increase in size it becomes still more perplexing. All lines of railway which center in the large cities run local trains at intervals of a few minutes from the suburbs to their central stations. Street car lines lead from all parts of the city, and from many suburbs of the business portion, and in New York, Chicago, and a few other



cities, these are supplemented by several lines of elevated railway. But during the morning and evening hours all means of transportation are taxed to their utmost. The streets in the business center of every large city become very much overcrowded, and, in order to avoid this, Boston and New York have constructed underground railways, known as subways, which pass under the streets of the most crowded portions. In New York a subway system which can transport over 300,000 passengers a day has been completed, and this to quite an extent relieves the overcrowding.

Nearly every city has one or more parks open to the public as pleasure grounds. Such cities as New York, Chicago and St. Louis have several large parks located in different parts of the city and, in addition to these, numerous small ones so located that they enable the people of the most crowded portions to reach them without traveling a long distance. The schools and churches are usually distributed throughout the residence portions, so as to accommodate the people to the best advantage.

**SEAPORTS** There are a number of cities on the Atlantic and Pacific coasts that are important seaports.

Among them are :

**Boston** Boston is the second port in importance on the Atlantic seaboard. It has one of the best harbors in the country, though it is not as large as that of New York. Previous to the construction of the Erie Canal, Boston was the leading port of the country, but the opening of that waterway gave New York an advantage because it brought to it a large trade that before the construction of railways Boston could not reach. Nearly all of the export and import trade of New England is carried on through Boston and in addition to this, it receives for export a large amount of produce from the west. A number of important lines of railway center in the city, and each has good western connections. Its ocean routes lead to Liverpool, Glasgow, Hamburg and important seaports on

the Mediterranean, while its coastwise trade is very extensive. Boston is one of the great financial centers of the country, and has contributed much of the capital used in establishing cities and industries in the West. Its most important local industries are the manufacture of iron and steel goods, printing and publishing, sugar



POST-OFFICE SQUARE, BOSTON

refining and the manufacture of boots and shoes. It is also the first leather and wool market of the country.

**Baltimore** Baltimore is situated near the head of Chesapeake Bay, 180 miles from the Atlantic. It has a fine harbor and carries on an extensive export trade. It is the greatest oyster market in the world, and the gathering, canning and



shipping of oysters is one of its most important industries. It is also an important tobacco market and has extensive iron and steel works. It is one of the leading commercial centers.

**Philadelphia** Philadelphia is 100 miles from the ocean, but the Delaware River, upon which it is situated, affords it a good harbor, and the depth of the river is such as to admit of its navigation by large ocean steamers, even at low tide. In the early history of the country this was a much more important commercial center than either New York or Baltimore, but its geographical position was not such as to enable it to maintain its supremacy after the construction of the Erie Canal and numerous lines of railway, which sought New York and Baltimore. Its principal exports are food stuffs, iron and steel, petroleum, coal, cotton, leather goods, and woolens. It is an important manufacturing center and its industrial interests greatly exceed those of a commercial nature. It has extensive woolen mills and is the largest carpet manufacturing center in the world. While it is situated on several important lines of railway, they all pass through it and terminate in New York.

**New Orleans** This is the great seaport for the Gulf of Mexico. Like Philadelphia, it is situated on a river more than 100 miles from the sea. At one time, it was thought that New Orleans would become the leading commercial city of the country, but the construction of railways deprived the Mississippi of much of its importance as a commercial highway. The city's most important trade is in cotton, of which it exports large quantities to all of the cities on the Atlantic coast and to Europe. The commercial interests of New Orleans were greatly advanced by the improvement of the mouth of the Mississippi River under the direction of Capt. James B. Eads, who, by the means of jetties, caused the current to excavate a channel to a depth of thirty feet, thus allowing the largest ocean-going vessels to reach New Orleans

without difficulty. The city is now developing an important trade with Mexico and the Central American states.

**San Francisco** This has long been the most important port on the Pacific coast. It is situated on one of the



FERRY HOUSE, SAN FRANCISCO

finest harbors in the world, which is deep enough to admit the largest vessels regardless of the ebb and flow of the tide. Its thriving commerce is carried on with the ports of China and Japan, and in addition to this it has a greatly increasing trade with Hawaii and the Philippine Islands. Its exports consist largely of wheat-flours, fruits, leather, wines, and meat products. Lines of steamers also connect it with most of the Pacific ports of South America, as well as all of the important coast towns of the Pacific States.



Oakland, across San Francisco Bay, is the meeting place of several transcontinental lines of railway.

**Seattle** Seattle, situated on Puget Sound, has an exceptional harbor, and is the terminus of several transcontinental lines of railway. It is rapidly developing into an important seaport, and has lines of steamers making direct connection with the important cities of China and Japan, and in its trans-Pacific trade reaches eastward as far as Liverpool and London. It is also the headquarters for all the lines of steamers for Alaskan ports. The rapid growth of the business interests of this city during the last decade, has been remarkable, and it bids fair to become the most important commercial port of the Pacific coast. (For a view of the harbor, see page 42.)

**LAKE PORTS** The commerce of the Great Lakes is carried on between a number of cities that have attained their importance largely on account of this traffic. These are:

**Duluth** Duluth, situated at the western extremity of Lake Superior, is at the head of the Great Lakes. Though a comparatively young city, it has assumed an important position in the commerce of the country. Extensive ore-docks and grain elevators, from which ore and grain are loaded upon the boats to be taken to ports on the lower lakes are located here. Duluth furnishes a natural lake port for the grain of Northern Minnesota and the Dakotas. Much of the coal and other heavy freight, which is shipped into these regions from the Eastern states, is also sent to Duluth by boat.

**Milwaukee** This is a city of about 458,000 inhabitants, situated on the western shore of Lake Michigan, eighty-five miles north of Chicago. It has extensive manufactories, and the largest breweries in the country. Its lake traffic is, next to Chicago, the most important on Lake Michigan. Railroad ferries connect this city with Grand Haven and one or two other towns on

the eastern shore of the lake. It is also an important center for railways running through Wisconsin, and is in the midst of a thriving agricultural country.

**Detroit** Situated on the Detroit River, this is not only the most important lake port between Chicago and Duluth and Buffalo, but is also the largest center for the manufacture of automobiles in the United States, if not in the world. The centering of these and other manufacturing industries in and around Detroit has caused a rapid increase in the city's population, which, in 1916, was estimated at 572,000. More tonnage passes through the Detroit River than through any other inland body of water in the world.

**Cleveland** Cleveland is one of the most important cities of Ohio and the lake region. Situated on the southern shore of Lake Erie, it has an excellent natural harbor and is the center of the hardware and grain trade and coal and iron-ore shipping. The city also has a number of important manufactories, is a railway center and a convenient shipping port for much of the freight that finds its way from New York, but especially from Pennsylvania, to the ports on the upper lakes. A large portion of the iron-ore from the mines in Minnesota and Wisconsin is transferred from boats to cars at Cleveland. The Ohio Canal connects the city with the Ohio River and affords an important outlet to the Mississippi.

**Buffalo** The importance of Buffalo at the foot of Lake Erie has already been mentioned. It has an extensive trade, and is the most convenient port for the trans-shipment of goods from lake steamers to the Erie Canal and to railways. The amount of freight brought down the lakes and re-shipped from this point gives employment to a large number of people.

**RIVER PORTS** A few cities located upon the Mississippi and its tributaries are important river ports.

**St. Louis** This city is situated on the west bank of the Mississippi just below its confluence with the Mis-



souri. It is one of the largest and most important cities in the Union, and now has a population of more than 750,000. It is the great commercial center of the Mississippi Valley, and is the distributing point for the territory lying to the south and southwest. Next to Chicago, it is the most important city in the interior. Lines of steamers ply between St. Louis and New Orleans throughout the year, and during the summer months the traffic is extended to the northern river ports. It is a great grain and flour market; also handles large quantities of tobacco, cotton, cotton-seed oil, and sugar, and contains important glass works, breweries, flour mills, and car shops. The city is connected with East St. Louis by the celebrated Eads Bridge, which is one of the most noted of its kind in the world. The erection of this bridge has caused numerous lines of railway to center in East St. Louis, which is a thriving and important suburb, although in another state. The Louisiana Purchase Exposition, held in St. Louis in 1904, greatly increased the city's business during the years of preparation for the Fair.

**St. Paul** This city is at the head of navigation on the Mississippi, and is the great railway center of the Northwest. It has numerous factories, some flouring mills, and has become an important wholesale and distributing point for the great states lying to the west.

**Kansas City** This city is on the Missouri River, and is a great railway center. Its river traffic is not as important as that of some cities of smaller size, but its geographical position is such as to make its railway connections far reaching. While contending against natural disadvantages, it has become one of the most important business centers in the central portion of the country. It has a large traffic in live-stock, and in meat-packing ranks next to Chicago.

**Cincinnati** This is the most important city in the Ohio Valley, and carries on an extensive river traffic. The

Miami Canal gives it a water connection with Lake Erie, and it also is the center of a number of trunk lines of railway. It has important pork-packing establishments, and extensive manufactories, among them the largest soap factory in the country.

**Pittsburgh** Situated at the junction of the Alleghany and Monongahela Rivers, Pittsburgh is practically at the head of navigation on the Ohio. Its position in the center of the coal and iron mines of the region has made it a city of great manufacturing importance. It is also one of the largest shipping points for coal, iron and steel. The leading industries are the manufacture of iron and steel, and glass. The presence of natural gas and its close proximity to the ore fields have enabled Pittsburgh to secure an abundance of the most suitable fuel for manufacturing purposes at comparatively little expense, and this advantage has contributed very much to its industrial development.

## QUESTIONS

Why are there so few seaports on the Pacific coast? Account for their location.

What has given Duluth its commercial importance?

Why do similar industries locate near each other in a city? Why would it not be an advantage to have the wholesale and the retail establishments in the same locality?

What has made Boston the most important city of New England?

Why are there no great cities in Iowa, Nebraska or Kansas?

What are the most important industries in each of the following cities: Baltimore, Buffalo, New Orleans, Minneapolis, Providence?

What important cities in the United States have increased in population and wealth because of the building of bridges or canals near them?



## CHAPTER XVII

### NEW YORK AND CHICAGO

New York and Chicago are our two most important commercial and financial centers, and in point of location, plan and other features, follow very closely the general plan of a city outlined in the last chapter. While it would be of interest to describe these cities fully, the purpose of this work will admit of a description of only their commercial and industrial features.

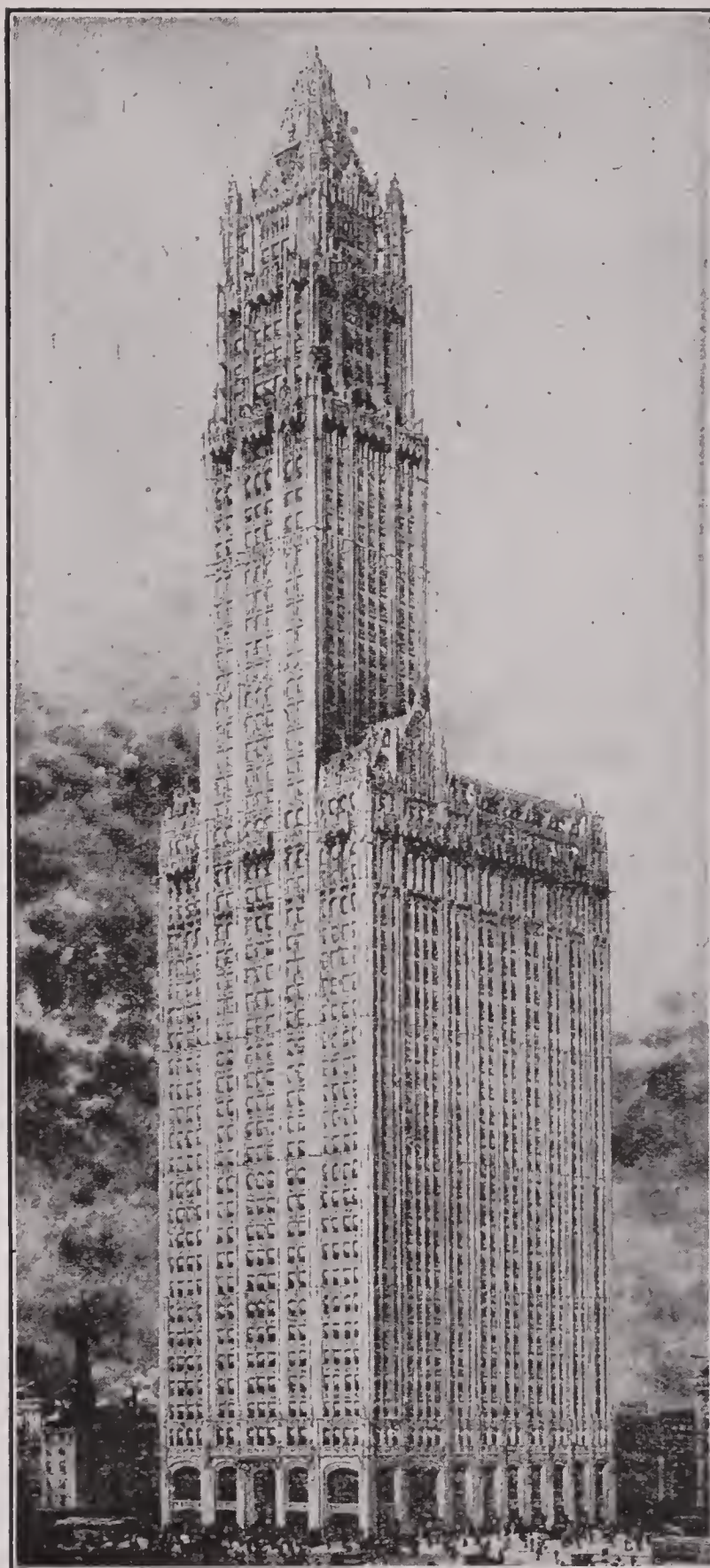
#### NEW YORK

##### **LOCATION AND EXTENT**

New York is the largest city in America, and after London, the largest in the world. It is located on New York Bay at the mouth of the Hudson. In its outline it is rectangular. Its greatest extent from north to south is about thirty-three miles, its greatest width about fourteen miles, its area is 327 square miles, and its population about 5,623,000. The western boundary follows the Hudson and the Channel to the west of Staten Island and is comparatively regular, but the eastern boundary is very irregular. As now constituted, the city includes New York proper, Brooklyn, Long Island City, and Staten Island. For purposes of administration it is divided into five boroughs, as follows: Manhattan, Bronx, Queen, Brooklyn, and Richmond. Manhattan coincides with Manhattan Island and is the most densely populated, and contains most of the great financial and commercial establishments.

##### **PLAN**

The first settlements in New York were made on the southern end of Manhattan Island, where there were good facilities for constructing piers. This determined the



WOOLWORTH BUILDING, NEW YORK  
(Copyright, 1911, by F. W. Woolworth)



shipping portion of the town, and the other portions are in the most convenient, adjacent localities. Good harbor facilities on Long Island caused the village of Brooklyn to be started there. The shipping portions of the city proper extend along both shores of the lower part of Manhattan, and along the water front of Brooklyn. Manhattan alone has a water front of 123 miles, and the total frontage within the limits of Greater New York is 577 miles. There are also extensive docks on the west bank of the Hudson, at Jersey City, Hoboken, and Weehawken, New Jersey. Only a small portion of the frontage is occupied.

The great business center is crowded into the southern part of Manhattan. Below Twenty-third Street are the great docks for ocean steamships, and back of them are the produce markets. The region along Broadway from Chambers to Tenth Street is devoted to the wholesale trade and west of Broadway below Canal Street lies the largest wholesale dry goods center in the country. Farther up Broadway is the retail shopping district. The principal retail streets running north and south are Sixth Avenue and the Bowery, and those running east and west are Fourteenth, Twenty-third, and Forty-second streets. The exchange and banking district lies in the center of the lower half of Manhattan. Here are located the great banks and office buildings. The chief financial center is on Wall and Board Streets.

The exchange district contains more magnificent buildings than are found in any other equal area in the world. Chief among them are, the Woolworth Building, 55 stories high; the Singer Building, 41 stories; the buildings of the Adams Express Company, the Standard Oil Company, the Manhattan Life Insurance Company, the new banking building of J. P. Morgan & Company, the United States Sub-treasury, and the Bankers' Trust Building, which is 39 stories high. New York cannot extend the area of her exchange district, so she has resorted to the device of tall buildings,





THE MUNICIPAL BUILDING, WITH CITY HALL IN THE FOREGROUND, NEW YORK



and all the modern structures in this part of the city are sky-scrapers, ranging from 22 to 40 stories in height.

There are a number of manufacturing regions. Some are on the water front in Brooklyn where the great sugar refineries are located; some are in the Borough of Queens, and others are located outside of the city limits in Jersey City and Hoboken. The land adjoining the shipping portion on Manhattan has become too valuable for other purposes to admit of manufacturing in that part of the city.

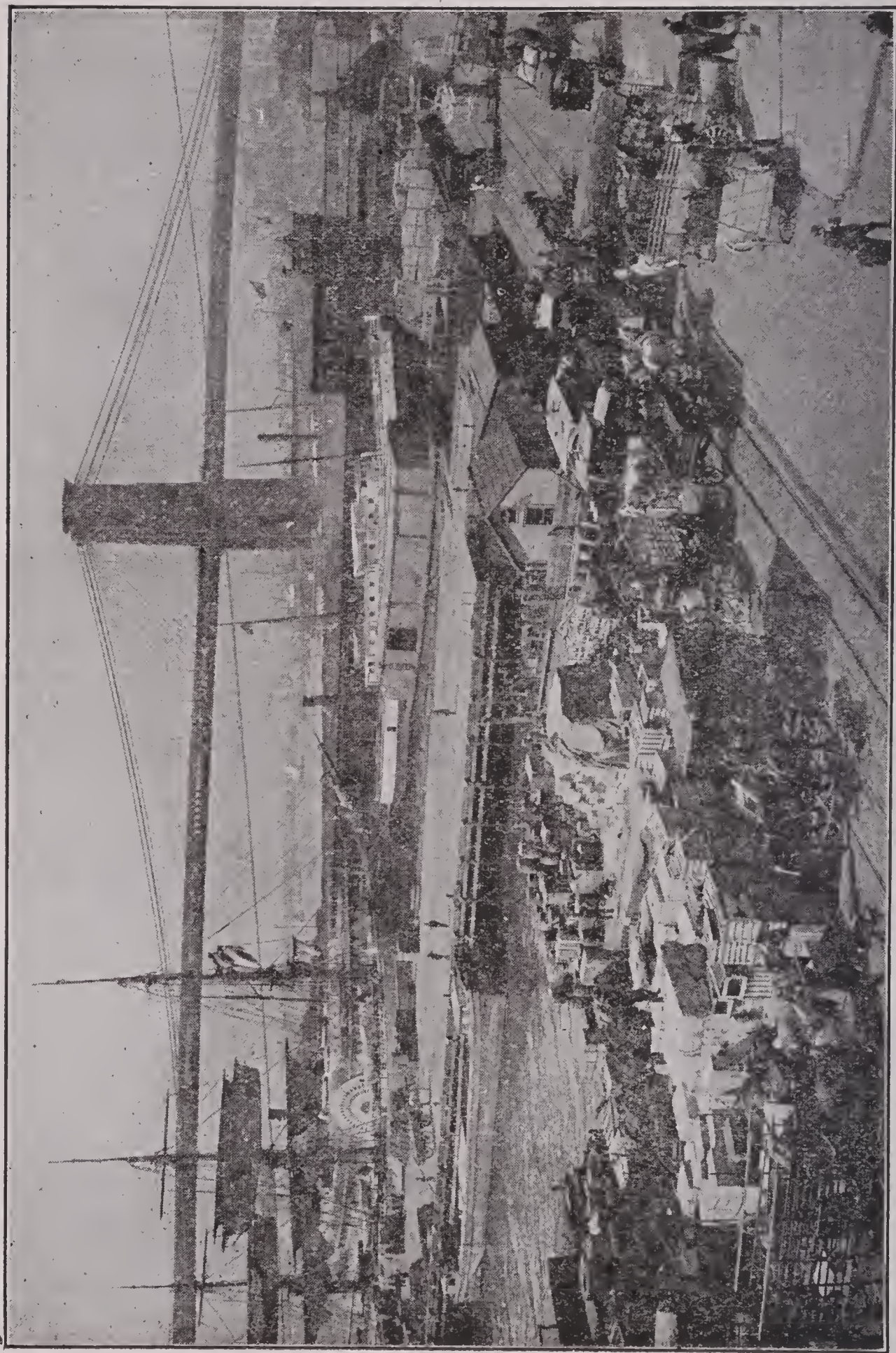
The residence portions are in the northern part of Manhattan and in Brooklyn, south and east of the shipping and manufacturing portions, and in the Borough of Queens. There are, also, many beautiful suburbs extending for miles up the Hudson, and others in New Jersey, beyond the business portion of Jersey City.

## TRANSPORTATION

The crowded condition of the business center of New York compels the people who work

there to reside some distance from the heart of the city, and the problem of transportation has always been one of great difficulty. Car lines are found on the principal streets running north and south, and on many of those running east and west. Elevated railways and subways extend from the lower part of Manhattan to all the principal parts of the city. Four bridges span East River and four tunnels have been excavated under it to accommodate railways and subways. Numerous ferries ply on the Hudson between Manhattan and Jersey City, Hoboken and Weehawken, and on East River between Manhattan and Brooklyn. The Pennsylvania and the Hudson and Manhattan railways enter the city by means of tunnels under the Hudson. The New York Central lines enter the city from the north. The Grand Central Passenger Station and the station of the Pennsylvania Railway are the finest structures of their kind in the world, and the tunnels under the Hudson and East rivers constitute the most extensive enterprise of this sort yet attempted in America.





SCENE ON THE WATER FRONT, NEW YORK



**MANUFACTURES**

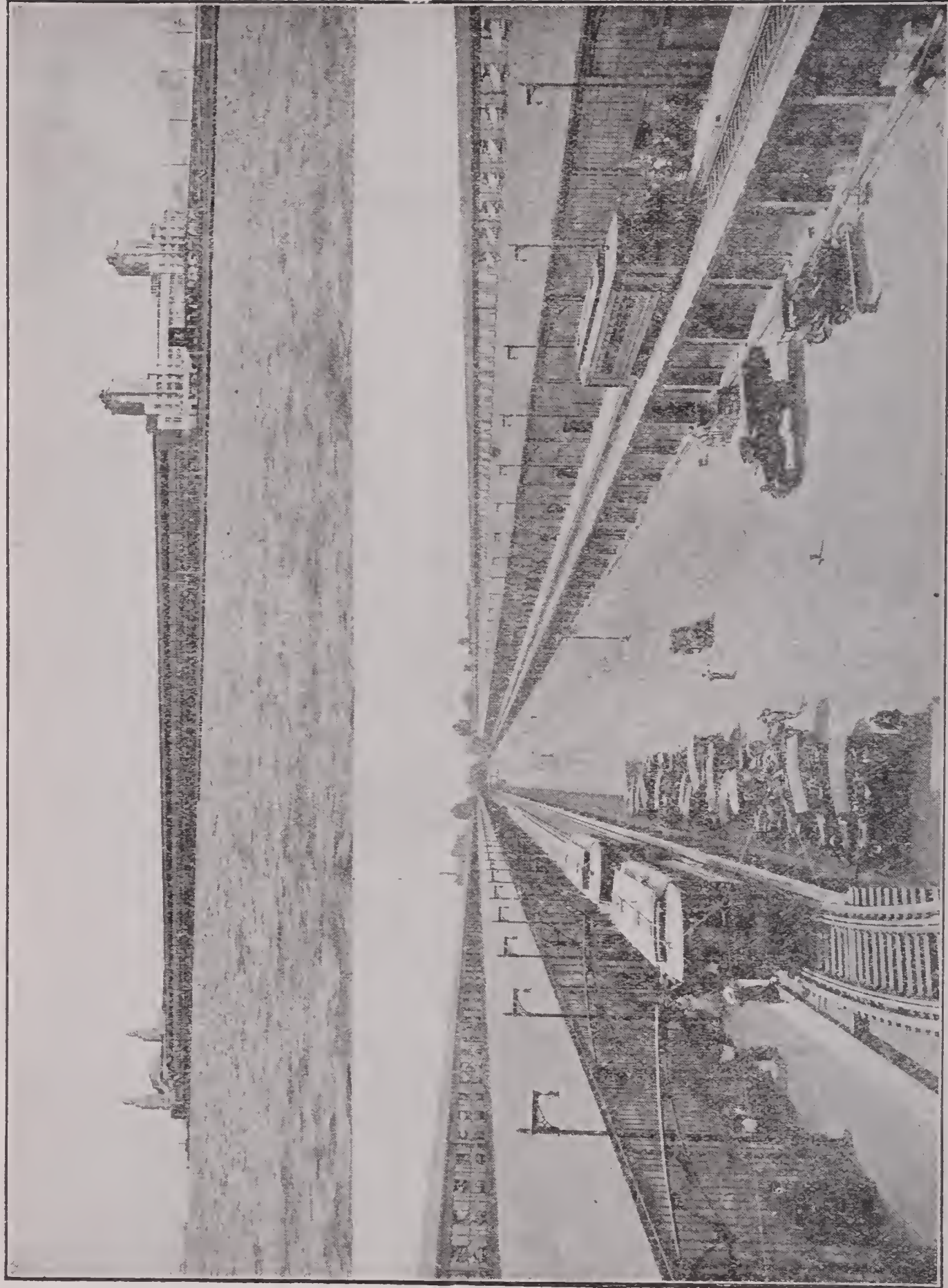
New York is the port through which most of the emigrants pass, and many of them remain in the city, consequently its population contains people from many nationalities. For this reason, there is an abundance of cheap labor, and this is one of the important conditions which determine the variety and character of the city's leading manufactures. New York is the largest manufacturing center in the country, exceeding, by fifty per cent, the manufactures of any other



THE NEW PENNSYLVANIA R. R. TERMINAL STATION, NEW YORK.

city in America. The manufactures are of great variety, almost everything wanted in a civilized country being made here. The most important industry is the manufacture of clothing, which amounts to over two hundred million dollars a year. A large part of this work is done in tenement houses by cheap labor, in a manner similar to that in European cities, from which many of the workmen came. Other leading industries are the refining of sugar, the manufacture of iron and steel wares, printing and publishing,





CHICAGO MUNICIPAL PIER (Top View Shows the Outside and Bottom View the Inside)



manufacturing malt liquors, various forms of tobacco and cigars, and the roasting and grinding of coffee.

**TRADE**

New York is the greatest commercial center of the Western Hemisphere. The Harbor has over a hundred square miles of anchorage, and nearly 4000 vessels engaged in foreign trade clear from the docks each year. The combined tonnage of this trade exceeds eight million, which is only a little less than that of the foreign trade of London. The coastwise trade is even larger than the foreign, and the two combined make New York the largest seaport in the world. Fifty-five per cent of the imports and nearly three-fifths of the exports of the United States pass through this port.

Steamship lines connect New York with all the important commercial cities of Europe and South America, and with some in Asia. The peculiar location of the city gives it great advantage in export trade and with the great grain states of the Mississippi Valley, since, by means of the Great Lakes, Erie Canal, and Hudson River, freight can be transported from this section by water much more cheaply than by rail. The prestige as a commercial center, which New York acquired soon after the opening of the Erie Canal, also directed lines of railway to it, and its railway traffic has become very large. Besides this, New York is the location of the great stock market of the country, whose daily transactions are measured by millions of dollars.

## CHICAGO

**LOCATION  
AND EXTENT**

Chicago, next to New York, is the largest city of the country. It is situated on Lake Michigan and the Chicago River. The city is built upon a comparatively low and level tract of land, and extends along the lake front 26 miles from north to south. In width it varies from six to ten miles, and has an area of about 200 square miles.

**CHICAGO**

Chicago is noted for its growth which has been more rapid than that of any other large city in the world. While other cities have had booms, the growth of Chicago has been continuous. Joliet and Marquette, who stopped there in 1673, were the first white men to visit the site. The first white settler, John Kinzie, arrived in 1804. The same year the United States government built Fort Dearborn. The fort was abandoned in 1812 after an Indian massacre, but it was rebuilt in 1816.

In 1833 the town had 550 inhabitants. In 1840 the number had increased to 4,480. At the time of the great fire in 1870, the town had grown to a city of 300,000. By 1880 the city had passed the half-million mark; in 1890, just before the World's Fair, the population exceeded 1,000,000; in 1910 it was 2,185,283, and in 1920, with a population of over 2,700,000, Chicago had become the fourth largest city in the world.

The growth of Chicago has been due to her location at the head of the navigation on Lake Michigan, making the city a convenient distributing point, and to the development of the surrounding country and the great Northwest.





WRIGLEY BUILDING, CHICAGO

named *North*, as North State Street and North Clark Street, while south of Madison they are named *South*, as South State Street, South Clark Street. Likewise streets extending east and west have the prefix *East* to those parts east of State Street, and the prefix *West* to those parts west of that street. The numbers run 800 to the mile; thus 800 North Clark Street would be one mile north of Madison Street.

The shipping portion is on the Lake front near the river, and also extends up the river for some over two miles. Besides the wharves on both banks, numerous others are found on canals that lead from the river to coal docks and manufacturing establishments. Another series of docks is located at South Chicago, near the mouth of the Calumet River. The large railroad yards occupy several localities within the city limits, but are all connected by a belt line, so that freight reaching the city on any line can be transferred to any other without reloading.

Chicago has several manufacturing centers, some being located in each portion of the city. Many factories are located on or near the river, or some of the canals. The great steel mills are in South Chicago near the Calumet. The stock yards, with the great meat-packing houses, are on the South Side, extending along Halsted Street, from Thirty-ninth to Forty-third Streets, and many light manufactories are located on the West Side.

The exchange portion is in the northern end of the South Side, crowded largely between the River and the Lake front, and extending southward as far as Roosevelt Road. Within this area are most of the wholesale and retail establishments, the Board of Trade Building, the Federal Building, all of the large bank and office buildings, the Art Institute, the Public Library, the Masonic Temple, the great department stores, the Auditorium and other leading theatres. Some of these office buildings have 6000 occupants. Either in this section, or on the adjoining banks of the River, are the great



railway stations, seven in number. Market Street and Wells Street are largely given to the wholesale trade, and South Water Street is occupied by the produce markets, while most of the retail trade centers upon State Street and Wabash Avenue. La Salle Street corresponds to Broad and Wall Streets in New York, as the center of the leading financial institutions.

The residence portions of the city are found in all three of its main divisions, being the largest on the South and West Sides. These residential portions of the city and adjoining suburbs are connected with the business portion by surface and elevated lines.

**TRANSPORTATION** The business section of Chicago is congested and the problem of transporting the people to and from their places of residence is one that has always caused more or less difficulty. A number of the long streets extending north and south are occupied by street railways, and most of the important streets in the west division are similarly equipped. Three tunnels connect these railways with the business district. In addition to these, there are four lines of elevated railway which meet in a loop in the exchange portion, and afford excellent facilities for those living on or near their lines. They extend to each division of the city. There are as yet no subways for passengers, though a system of tunnels for carrying freight is in operation. During the morning and evening hours all transportation lines are badly crowded.

**MANUFACTURES** The location of Chicago for manufacturing purposes is very favorable. Her transportation facilities are unequalled, and her proximity to the coal fields of Illinois make fuel abundant and cheap. For this reason, extensive steel works have been located at South Chicago. The great packing houses, which were described in Chapter IV, are located in the southern portion of the west division. The great harvester works of the McCormick and Deering Harvesting Companies, now

consolidated under the name of the International Harvester Company, are also located in the city. Large furniture factories, piano factories, boot and shoe factories, machine shops, soap factories, and numerous other industrial institutions are also found in various parts of the city. The manufacture of clothing is an important industry, the output amounting to about \$101,000,000 a year. As in New York, much of this work is done in homes by people who have emigrated from the old countries.

**TRADE** Chicago is the distributing center for the vast territory lying to the west and northwest. Her situation on Lake Michigan gives her water communication with the Great Lakes and, through the system of canals on the St. Lawrence, with the Atlantic Ocean. The central location of the city, combined with its facilities for lake transportation, have made it the greatest railway center in the world. Railroads whose aggregate mileage exceeds 120,000 miles, or more than two-thirds of that in the entire United States, center in Chicago, and the freight and passenger traffic in the city is enormous. The harbor is along the Chicago and Calumet Rivers, which have been broadened and deepened for this purpose. The Chicago River has been improved by extending its mouth into the lake and the lake front has, in addition to this, government breakwaters nearly two miles in length. Ships can pass up the Chicago River for a long distance, and many branch channels, called slips, have been excavated so as to enable them to reach coal docks and large manufacturing establishments located in various parts of the city. The completion of a large municipal pier on the lake front, north of the river, has greatly increased the shipping facilities.

The greatest export trade in Chicago consists of grain, flour, dressed meat, and livestock, while her principal import is lumber, the city being one of the largest lumber markets in the world. This is due to the fact that lumber can be brought to this point





STATE AND MADISON STREETS, CHICAGO



on the lakes much more cheaply than it can be transported by rail, and from here it is distributed over the various lines of railway to the different parts of the country. Chicago is the greatest wheat and produce market in the country, and large quantities of grain are received and distributed to other centers. Manufactures, including clothing, machines, pianos and organs, and many other articles, are also exported in large quantities. A characteristic feature of the retail trade is the existence of a number of large department stores, which seem to have reached perfection of development in this city, that of Marshall Field & Company being the largest retail store in the world.

### QUESTIONS

Why is the population in certain parts of New York so dense? Is this true of any other American city?

What causes have made New York such an important manufacturing center?

Why is the commerce of New York greater than that of Boston? Why does not Philadelphia have an equally large trade?

What are the reasons for Chicago's location? What causes have contributed to the city's rapid growth?

Why is Chicago a more important railroad center than either New York or St. Louis?

How does the trade of Chicago differ in character from that of New York? What is the reason for this difference?

What makes Chicago an important manufacturing center?



## CHAPTER XVIII

### EXCHANGE

**MONEY** We have already learned that men first began to trade by exchanging their products with each other. While the number of products were limited and the wants were few, transactions of this sort were possible, but with the increase in the number of wants and also in the number of commodities this sort of trading became impracticable. The shoemaker could not well go around to the tailor, the farmer and the miller to dispose of his shoes for what each of them produced, and it became necessary for men to have some article which could be used as a uniform medium of exchange. Such an article is known as money. Money is not an institution of civilization, for since the remotest time, barbarians and partially civilized people have used something as a medium of exchange. The Indians used wampum; the tribes of the desert regions in the interior of Africa use salt; the Japanese and Chinese formerly used tea; the Romans used iron; and the early settlers in Virginia used tobacco as a currency.

In order that any medium may be used for money, it must be something that everyone is willing to receive in exchange for what he has to sell. It must have a fixed value; it needs to comprise the value within a comparatively small space, and it must be capable of receiving and retaining stamps which show its valuation. Of all the mediums that have been used for money, gold and silver meet these requirements more nearly than all other materials combined. Paper money is used by the United States and many other nations, but it is of value only so far as it represents gold and silver, for which it may be exchanged at par on the desire of the

holder. The paper money of the United States and of Great Britain is exchangeable at par in all civilized countries. This is because it represents gold.

The money of the United States consists of gold and silver coins, nickel and copper coins, United States treasury notes, gold certificates and silver certificates, both of which are issued by the



A UNITED STATES MINT

general Government, and of the notes issued by the national banks. All of these issues of paper money are protected by specie or bonds, in the possession of the treasurer of the United States. For this reason they never fluctuate in value and are in more general use than the gold and silver which they represent, because they are more convenient to handle and carry.

**BANKS** A bank is an institution for receiving money and granting loans. If it is a national bank, it also has the



authority to issue paper money to the value of a certain amount of its stock. Banks aid business in the following ways :

*First.* They serve as safe places in which to deposit money. This is necessary, as but few business men have places where they can keep on hand a sufficient amount of money to transact their business without incurring great risk of loss through robbery or fire.

*Second.* They cause more money to be used than would otherwise be possible. Many people who deposit money in the bank do not have a sufficient amount over and above their needs to admit of loaning it, but when many small amounts are gathered through these deposits, the bank can loan them in large sums. In this way the bank makes useful money that without such an opportunity would lie idle.

*Third.* Banks enable many payments to be made without the direct use of money. If A buys of B merchandise to the amount of \$100, and both A and B deposit their money in the same bank, A, by writing an order on the bank to pay B \$100, causes that amount to be charged to his account and credited to B on the books of the bank. The debt is paid, and no money has been handled. This may be equally true if A lives in Chicago and B in New York. That is, A may obtain from his bank in Chicago an order on some bank in New York to pay B the desired amount. B deposits this order in the bank where he does business, and the amount is placed to his credit. Again no money has been handled, but the debt is paid. If signed by the depositor, the order is called a *check*; when made by one bank on another and signed by the cashier or other officer, it is called a *draft*. Drafts are generally used in making remittances to people at a distance.

### THE CLEARING HOUSE

Banks receive on deposit the checks, drafts and money offered by their depositors. These may be on the bank in which the deposit is made,

or on a number of other banks, either in the depositor's city or in other cities. The depositor is given credit for the amount which his various checks and drafts represent, and the bank makes settlement with the other banks on which these papers are drawn. In small towns, banks exchange checks with each other and balance their accounts at frequent intervals, if not daily; but in large cities, where there are numerous banks, such a method of procedure would require a great deal of time and labor. To avoid this, a clearing house is established.

The clearing house is an association of banks which combine, under regulations that they agree upon, for the purpose of exchanging checks and balancing their accounts with each other daily. The clearing house is in charge of a manager. Each bank represented has a desk at which a clerk is stationed. At a certain hour in the day—as ten o'clock in the morning—a clerk from each bank appears at the clearing house with checks which that bank has received upon the other banks in the association. These are in separate packages so that the amount which each bank owed to the others is quickly ascertained by the manager. After these packages have been examined, they are distributed to the different clerks. Then the clerks from the various banks pass from desk to desk and exchange checks. If a balance is due, the amount is noted, and it is made payable through the clearing house. In this way all the accounts are checked and balanced in a few minutes, and a great amount of labor and inconvenience is saved.

In addition to this, the banks in the association have uniform regulations in regard to accepting and paying checks. These regulations are to them a protection against fraudulent transactions. There are now some sixty-four clearing houses in the United States. The largest is located in New York, and its transactions are several times the amount of those in any other city; the next largest is in Chicago.



**Bank Earnings**      The question may arise: How can banks afford to receive money and cash checks for their depositors? The banks receive their revenue from the loans which they make. A much larger amount of money is usually deposited than is required to meet the transactions as they occur, from day to day. The law providing for the establishment of banks requires that, in addition to the amount needed for daily use, a certain proportion of the deposits be kept as a reserve fund. All funds over these amounts the bank is allowed to loan on proper security. The interest which it derives from these loans constitutes the revenue it receives for transacting the depositors' business, and the pay is usually ample.

**CORPORATIONS**      Many lines of business require such a large amount of capital that people are seldom found with sufficient means to carry them on singly. The construction and operation of great lines of railway, the building of ships and the erection of iron-mills and large factories are good illustrations of such lines of business. In order to secure the necessary capital, corporations are usually formed. A corporation consists of a number of individuals who associate themselves together for a definite business purpose, and obtain from some state a charter, which is a contract binding them to certain agreements and restricting them to the lines of business stated in its terms. When such a corporation is organized it can obtain money by selling shares in the business. These are known as *stocks*, and are usually sold in shares of one hundred dollars or fifty dollars. When sold at the rate of dollar for dollar, stocks are at par; if sold for less than their face, they are at discount; if for more, at a premium.

There are two kinds of stock, both of which are often issued by corporations. They are known as common and preferred stock. The preferred stock is that upon which a certain rate of interest is guaranteed regardless of the earnings of the corporation, and the

common stock is not subject to interest, but its holders receive their share of any dividends that the corporation may earn. The issuing of stock is a strictly proper and legal business, so long as the amount issued does not exceed the actual amount paid in; but the great danger in these corporations is that they will issue many



UNITED STATES SUB-TREASURY, NEW YORK

more shares of stock than the capital of the corporation warrants. All stock over the amount represented by the actual capital is called "watered stock," and its issuance often leads to financial embarrassment.

## **BONDS**

Corporations in need of money for establishing a business or for its enlargement, often secure it by



issuing bonds instead of selling their stock. Bonds are usually considered the safer investment for the party making the loan, as they are a mortgage on the property, and if the principal and interest are not paid, the holder of the bonds has the right to proceed against the company. Most of the loans made by railroad corporations are secured in this way, and large manufacturing concerns often secure their creditors in a similar manner.

The corporation is usually managed by a few people who are elected as officers. These consist of a president, secretary and treasurer, and there may be several vice-presidents. The ordinary stockholders seldom have any voice in the management of the concern, and must run the risk of obtaining a dividend on their investment, or of being able to dispose of their stock at as favorable a price as they obtained it, should they desire to transfer their investment to some other enterprise.

### THE STOCK EXCHANGE

Many stocks and bonds are valuable securities, and are sought by those who have money to invest. For this reason, there are those in all large cities who make a business of buying and selling these securities on commission. Such men are known as stock brokers. In most of these cities there is some place where at a certain hour of the day, stocks and bonds are publicly offered for sale. In the United States such places are known as the Stock Exchange. The leading stock exchange of the United States is in New York. It fixes the market price of securities for the entire United States, and transacts more business than all of the other stock exchanges of the country combined. It is located on Wall Street and has attained a world wide reputation.

### BOARDS OF TRADE

Wheat, corn and other grains, are bought and sold in a manner similar to that employed in the buying and selling of stocks. In cities having large transactions in produce, boards of trade are organized. Members

buy and sell these commodities on commission, and for their own profit. Much of this buying and selling in Chicago and a few other large cities, is at public sale. The largest board of trade is in Chicago and it has a similar influence on the prices of produce that the Stock Exchange of New York has upon the prices of stocks and bonds. Its transactions amount to many millions of dollars a year.

In boards of trade and stock exchanges there are always two parties; those who wish to sell, and those who wish to buy. The first party naturally endeavors to keep the prices as high as possible, and to use every opportunity to raise them. For this reason they are known as the "bulls." While those who wish to buy, as naturally endeavor to keep the prices as low as possible and to seek every opportunity to bring them lower. These are called the "bears." Both of these terms are in common use in connection with the public sale of commodities. To "bear" stock or grain, means to attempt to reduce the price; while to "bull" stock or grain means to attempt to raise the price. However strange these terms may seem to one unacquainted with them, a brief explanation shows that they are very appropriate. The bull tosses things with his horns, while the bear pulls them down with his claws.

To the observer who is unacquainted with the method of these organizations, the scene in the Stock Exchange or Board of Trade when business is at its height, is one of the wildest confusion. It would seem that all the men present are shouting at the same time, and each one in a different language. Yet there is order and system in it all, and those who transact the business understand each other thoroughly, so that mistakes seldom occur. Transactions extending into millions of dollars are made in the shortest possible time, and no one who is a member of the organization can retract from an offer that he has made or accepted. Unfortunately some of the transactions partake of a fraudulent nature, as they are



based upon what are known as "futures," which simply means that the buyer and seller are both engaged in transferring commodities which do not exist. However, transactions of this nature form a very small part of the business done.

### MAKING REMITTANCES

Means of transmitting money safely are necessary to the transaction of business between parties living at a distance. When one has access to a bank money can be safely transmitted by means of a bank draft. The draft is made payable to the person to whom the debt is due, and can not be collected until endorsed by that person or firm. Therefore it is of no value to one finding or stealing it. Its loss would cause inconvenience, but not actual loss to the sender.

For those who are so situated that they do not have ready access to banks, the United States mails afford safe means of sending money. These are by registered letter and by postal order. In sending by registered letter, the money is placed in the letter and the registering fee is paid by placing the necessary stamp on the letter in addition to the regular postage. For this fee the government keeps a record of the letter every time it changes hands on its journey; also prepares a receipt addressed to the sender, and which must be signed by the person to whom the letter is addressed when it is delivered. This receipt is then returned to the sender who is thus notified of the receipt of the money by the proper party. In registering a letter the government agrees to keep a record of its transmission through the mails and to insure its delivery to the party to whom it is addressed. But the government does not guarantee the sender against loss by theft or the destruction of the letter by accident, hence the registered letter is not the safest method of transmitting money.

In sending money by postal order, the order is purchased at the home office the same as a bank draft. It is issued in duplicate

and made payable to the party to whom the debt is due. One copy is placed in the letter addressed to the person who is to receive the money, and the other is sent by the postmaster to the postmaster in the town where the money is to be paid. When the holder presents his order at the post-office and properly indorses it, he receives his money. By this means only the order is sent through the mails, and the risk of loss is very slight. Express companies also issue similar orders that are equally safe.

One should never send money through the mails in an unregistered letter, since in so doing one runs great risk of losing the remittance.

### QUESTIONS

Why did the Aztecs and Incas not use gold and silver for money, since they had an abundance of these metals?

Why are gold and silver the most suitable metals for money among civilized nations?

How does a bank aid the industries of a locality?

What is a clearing house? Of what advantage are clearing houses in large cities?

Are there any corporations in your locality? In what business are they engaged?

What is the difference between a Board of Trade and a Stock Exchange?



## CHAPTER XIX

### TRADE BETWEEN THE STATES

Trade with other countries is styled foreign commerce, and that within a country, domestic commerce. We have already seen that commerce depends upon the adaptation of each locality to some special line of industry, and upon the taste of individuals in choosing an occupation. When to this we add good facilities for transportation and a sound money system upon which to base credit, the conditions for a large commerce are nearly perfect. In the United States we find these conditions more fully met than in any other country.

**LOCAL INDUSTRIES** Our great extent of territory embraces many regions, which, on account of difference in soil, climate and natural resources, are as distinctly separated, industrially, as though they were under different governments. Furthermore, such regions as the cotton belt, the corn belt and the bituminous coal fields are each larger than the country occupied by any of such great powers as France, Germany or Italy. All of these regions sustain a thriving population, whose wants are supplied by exchanging their products for those of other regions.

**INDIVIDUALITY** In no other country do the inhabitants include such a variety of people. The population of the United States comprises representatives of all civilized nations, and these, with the native Americans, have developed into a people whose variety of tastes, range of occupations and independence in thought and deed have never been equalled. These conditions have led to a variety of occupations and created a multiplicity of wants.

**TRANSPORTATION  
AND CREDIT**

In railways, steamships, lakes, rivers and sea, we do not lack, and nearly every inhabitant is on or near one of these means of communication, though some are greatly embarrassed in transporting their produce, on account of the lack of good roads. Of money we have an ample supply, our system of credit is sound, and all these conditions have combined to build up a domestic commerce such as no other country maintains.

**MOVEMENT OF  
COMMODITIES**

The movement of a commodity depends upon where it is produced, where it is needed, and the distribution of population. The older states are the most densely populated, and although the center of population has been moving westward for more than one hundred years. In 1920 it was at White Hall, eight miles west of Bloomington, Indiana. The population of the agricultural regions is less dense than that of the manufacturing regions, and that of the mining regions is generally less than that of the agricultural regions. This distribution of population is an important factor in our commercial life.

**Grain**

The northern half of the Mississippi Valley and the Pacific Slope are the great granaries of the country. From the first region the movement of wheat and corn is eastward to the great centers of trade and manufacture, Chicago, Buffalo, Cleveland, New York, Boston, and other eastern cities receiving large supplies, either for local consumption or for trans-shipment. The grain of the Pacific States has a northern or southern movement, or is exported and goes westward to the Orient.

**Cotton**

Considerable of the cotton raised in the Southern States is now manufactured in the states where it is grown. However, this constitutes only a small part of the crop. Most of the product is sent northward, either for use in the mills of New England or for trans-shipment to Europe.



**Live Stock**

Live Stock follows the same lines as grain. It is raised or fattened in the grain-producing states, whence it finds its way to the densely populated states and cities, supplying them with meat. Less live stock than formerly is raised in the Rocky Mountain States. With few exceptions, practically all the meat in the country is produced in the great states in the Mississippi Valley, and is prepared for market in the packing market in the packing houses at Chicago, Omaha, Kansas City, and St. Paul.

**Manufactures**

The manufacturing centers send their wares to all regions from which they receive produce, or raw material. New England, the North Atlantic States, and those between the North Atlantic and the Mississippi River comprise the great manufacturing region of the country. There are large manufacturing establishments in Minneapolis, St. Paul, St. Louis, and some other cities. West of the Mississippi River manufacturing is not as general as farther east. Consequently all the vast area between the river and the Pacific Coast must be partially supplied by the manufactures from the eastern half of the country. And what is true of the West is equally true of the South.

Manufactures, then, in general, move west and south, and in addition to these general movements, there are those of a purely local character which increase the exchange of commodities between neighboring cities having different industries. This branch of trade is also increased by individual taste, as some people prefer goods from one city and some from another, and in order that the wants of all may be supplied, quite a complex exchange of commodities is necessary.

**Mineral Fuels**

Coal and petroleum are in constant demand, and their movement is to all parts of the country, though each section, as far as possible, is supplied with coal from its nearest sources, as the expense of freight on this commodity is great.

**Ore** The movement of ore is always to the place where it will be milled or smelted. Iron ore seeks the coal regions because it requires a large amount of fuel. Copper ore is reduced at or near the mines, because the transportation of the ore is more expensive than the cost of the fuel required to smelt it. The ores of gold, silver, and lead, which are usually reduced by combined mechanical and chemical action, are milled at or near the mines, and the metal is shipped to the points where it is desired. In general, the movement of these metals is eastward.

**Iron and Steel** Iron and steel are used in all parts of the country, and are shipped from the nearest steel mills to the desired localities. The Illinois mills supply most of the demand of the West and Northwest, but those of Pennsylvania and Ohio supply the East and South and the foreign trade.

**COASTWISE TRADE** Besides the movements described, there is one of great importance on both the Atlantic and the Pacific coast. This is the interchange of commodities between seaports of these respective localities. On the Atlantic and Gulf coasts this trade employs numerous lines of steamships plying on Long Island Sound and between Boston and New York, Philadelphia, Baltimore, Charleston, Savannah, Jacksonville, New Orleans, Galveston, and a number of other less important seaports. On the Pacific similar lines ply between San Francisco, Seattle, Portland, and Tacoma and Vancouver, British Columbia, and also between San Francisco and the ports to the south, principally San Diego and the port of Los Angeles.

The United States has the largest coastwise trade in the world. Its combined tonnage exceeds 3,120,000 tons, four-fifths of which belong to the Atlantic and Gulf coasts. This trade is by law reserved to vessels under the American flag, and the only competition that is offered these lines is that given by the railways. The



river, lake, and railway traffic has already been described in the chapter on trade routes.

Complete statistics of domestic commerce are not obtainable, as no record is required of goods not exported or imported, and its extent can only be estimated by the labor and capital required to carry it on. In addition to the ocean going vessels engaged in coastwise traffic, more than 4000 vessels are employed on the 20,000 miles of inland water, lakes, and rivers. The railway transportation requires 253,000 miles of railroad lines, which is about one-third of the mileage of the world, thus involving a capital of fifteen billions of dollars, a sum four times greater than the amount of circulating money in the United States. These railway systems earn yearly the enormous sum of \$6,225,403,000, which is more than three times the annual revenue of the national government in times of peace. The domestic commerce of the United States exceeds that of any other country.

### GROWTH OF CITIES

This remarkable development of our commerce is associated with other great movements which are constantly affecting our industrial and social life. One of the most important of these is the gathering of the people into cities. Large cities are, year by year, adding to their number of inhabitants, and small cities are becoming more numerous. In 1790 only 3.35 per cent of the population dwelt in cities of 8000 or more inhabitants; in 1840 the proportion was 8.52 per cent; in 1890 it was 29.20 per cent; in 1900 it was 33.35 per cent, or a little more than one-third of the entire population of the country; and in 1910 it was 34.9 per cent. In 1920 it exceeded 50 per cent.

### IMMIGRATION

The next important movement is that of immigration. The constant influx of foreigners is so great that it is affecting our social and political institutions, as well as increasing our opportunities for commerce and industry. The more we study our inland trade the more thoroughly are we

led to understand that the domestic commerce of the country is intimately related to every phase of our national life.

### QUESTIONS

Why has the United States so large a domestic commerce?

Why is such a large proportion of the produce of the agricultural regions taken to the cities? What do the cities send to the country in return?

What products are shipped in all directions from their sources of supply?

Why do the manufactures of the Eastern States find a market in the West and the South?



## CHAPTER XX

### ALASKA AND OUR ISLAND POSSESSIONS

**ALASKA** Alaska has an area of 600,000 square miles, nearly all of which is on or within the Arctic Circle, but owing to the warm current in the Pacific, those portions near the coast have a much milder climate than the latitude of the country would lead us to anticipate. The interior is broken and, in many places, mountainous. Streams traverse the valleys and, south of the Yukon, the hillsides and most of the lowlands are covered with a heavy growth of forests. Though the trees are not so large as those found in the forests of Michigan and Wisconsin, or Oregon and Washington, yet a large proportion are suitable for merchantable lumber, and lumber is now cut and sold in paying quantities, the sales in 1921 amounting to over \$1,223,000.

The hardier grains and vegetables are grown successfully as far north as the Yukon River, and the number of farms and gardens is increasing from year to year. Good breeds of cattle have been introduced, and the reindeer, introduced into the territory by the United States government in 1889, are of great benefit to the natives. Fox farming is practiced to some extent, but mining and the fisheries constitute the chief industries. In 1920, the largest towns were Juneau, the capital, 3058; Ketchikan, 2458; Anchorage, 1856; Sitka, 1175; Fairbanks, 1155; Condora, 955; and Douglas, 919. When the mining excitement on Seward Peninsula was at its height, Nome was a city of 25,000 inhabitants, with the modern conveniences of a city of its size in the older States. In 1920 it had only 852 inhabitants.

Alaska abounds in mineral wealth. Gold was discovered near Nome City on Seward Peninsula in 1898, and since that date large gold fields have been developed along the Yukon River and in the southeastern part of the territory. The output for 1920 was valued at \$8,535,700, and the value of all the gold mined in Alaska since its discovery there exceeds \$261,000,000. Since 1915, the mining of copper has developed rapidly and the value of the output now exceeds that of gold, the copper mined in 1920 being valued at \$10,658,700. Large coal fields have been discovered, and Alaska coal mines now supply local demands for this fuel. In 1904 marble quarries were opened near Prince of Wales Island, and they are furnishing some of the finest marble quarried in America. Salmon canning is carried on chiefly on and about Kadiac Island. This industry is one of the most valuable in the territory.

Regular lines of steamers ply between all Alaskan ports and Seattle and other cities on Puget Sound during the months when navigation is open, and the United States has established a regular mail service, so that, except during the most severe winter months, all citizens receive mail at regular intervals. Telegraphic communication by way of Dawson is now open to nearly all points in the territory. The population is about 60,000, and the government is that of an organized territory, the governor and judges of the courts being appointed by the President of the United States, and the territorial officers appointing the minor local officials. The United States mining and land laws have been extended to the territory, and there is every prospect of a rapid increase in settlement. About 400 miles of railway are in operation.

### **PORTO RICO**

This island, one of the most important of the West India group, was acquired from Spain in 1898. It is a little smaller than Connecticut, having an area of 3600 square miles, and a population of about 1,216,000. It is more densely populated than any state except Massachusetts and Rhode



Island. About one-third of the inhabitants are negroes and mulattoes. The better class are Spanish creoles, who live in the towns and control the industries and business affairs of the island. About three quarters of the population is rural.

Near the coast the land is low, but it rises as we go into the interior, where it becomes hilly and in places, even mountainous. The island is within the belt of the trade winds, and the northern part is abundantly watered, consequently the rivers in this part of the island afford acceptable harbors, and render important assistance to commerce.

Most of the island is divided into small farms, all of which are tilled by their owners. On the low slopes and the plains fruit farming is the leading industry; but coffee, tobacco, corn, and mountain rice are grown, and coffee has become an important article of export. In the interior cattle are raised on the hill farms, and the largest tobacco plantations are found on the narrow alluvial plains. The principal cities are San Juan, the capital, having a population of 48,700; Ponce, 35,000, and Mayaguez, 17,000. San Juan is 1411 miles from New York, with which it maintains regular communication by steamer.

Labor is cheap, and the establishment of manufacturing industries would be a great benefit to the people, as it would enable them to obtain better support than is possible under present conditions. Many of the native plants are suitable for textiles and cordage, and these could be manufactured with profit. The annual trade with the United States amounts to about \$97,000,000. Two-thirds of this amount consists in imports from this country and the balance in exports. The chief exports are sugar, coffee, pineapples, and other fruits, tobacco, molasses, and straw hats. The imports are cotton goods, rice, and codfish. The fish comes mostly from Canada, and the trade with other countries amounts to about \$2,000,000 per year. The roads on the island are poor

and the railroads few, but the United States Government has commenced the construction of roads between the most important trading centers, and American capital will undoubtedly extend the present railway lines.

The government consists of an executive council composed of a cabinet, the members of which are Americans appointed by the President of the United States; and five Porto Ricans. There is also a lower house, of thirty-five members, who are citizens of the island, and are chosen by popular vote. The governor is a citizen of the United States, and is appointed by the President. While the Porto Ricans are given a franchise and local and city government, they are not recognized as citizens of the United States. An excellent system of schools on the American plan is now in operation, and the number of pupils in attendance is increasing more rapidly than the school facilities will accommodate. Under American rule all conditions on the island are improving.

**HAWAII** The Hawaiian Islands lie at the crossroads of all great steamship lines of the Pacific. They are eight in number and are situated between  $155^{\circ}$  and  $160^{\circ}$  west longitude; have an area of 6740 square miles, a little more than three-fourths that of Massachusetts, and a population in 1916 exceeding 237,000. The climate is salubrious and equable, owing to the influence of the trade winds. The islands are of volcanic origin, and the soil, which has been formed by the disintegration of lava, is very fertile. It has accumulated in the valleys to a great thickness, and here most of the sugar-cane, which is the important crop of the islands, is grown. This industry employs nearly all of the capital and labor. The cane is cultivated on large estates which are owned by stock companies, but nearly all of the citizens of the island own stock in the corporation, so that their prosperity depends upon the condition of the sugar industry. Rice is the next most important crop, and is grown in swamps by Chinese who are not affected by



the malarial climate of these localities. Some coffee, pineapples, bananas, and vegetables are also grown, though only to supply local needs.

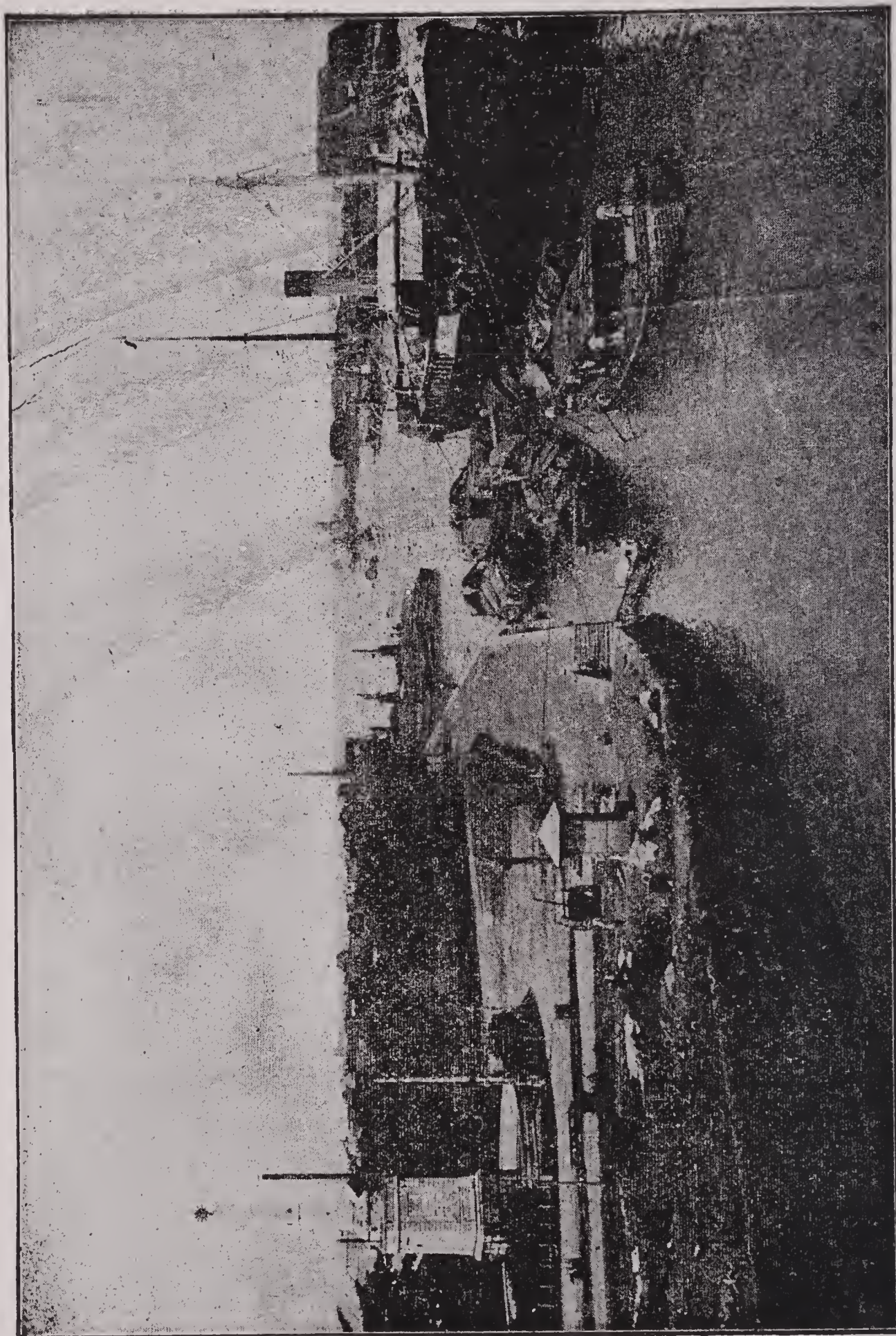
The forests contain many useful trees, but have been nearly destroyed to secure land for sugar plantations. Cattle and sheep for home consumption are raised in the interior; corn, wheat, rubber, grapes, tobacco, and silk worms could be successfully cultivated, but as none of these are as profitable as sugar-cane, they all give way to the sugar industry.

Honolulu, on Oahu Island, a city of 83,000 inhabitants, is the most important town. It has an excellent harbor, and is the port of call for the largest steamers crossing the Pacific. It is a thoroughly modern city, having electric lights, street railways, fine buildings, and all the improvements found in the best of American cities. The business of the islands is almost wholly in the hands of Americans and Englishmen. The position of these islands is remarkably favorable for commerce, and this accounts for their rapid increase of trade, since more steamers have begun to ply between the United States and the Philippine Islands, and other eastern ports. The islands constitute an organized territory, and have the regular form of territorial government.

#### **PHILIPPINE ISLANDS**

These islands form an archipelago extending from the fourth degree to the twenty-first degree north latitude. Their greatest extent from north to south is about 1500 miles, and from east to west about 650 miles. They lie directly east of the China Sea and north of the Dutch East Indies. The total number of islands is between 1600 and 3000, and their combined area about 120,000 square miles, being equal to that of Michigan and Wisconsin combined. Mindanao and Luzon, the two largest, are each about the size of the state of New York, and are classed among the large islands of the world. The other islands of importance are Samar, Negros, Panay, Palawan, Mindoro, Leyte, Cebu, and Bohol.





ENTRANCE TO THE PASIG RIVER, MANILA



The interior of the large islands is mountainous and heavily timbered. The forests contain mahogany, ebony, sandal-wood, and other valuable timber, and in extent are estimated to have an area of some over 40,000,000 acres. They are of great value, and in due time will become an important source of income to the islands. Fortunately, the forest areas are public land, and have already come under the protection of the national Government, so that the waste that the forests of the United States have been subjected to will be prevented here. The climate is tropical, with an abundance of rainfall. There are three seasons: the dry-temperate, running from November to February; the dry-hot, from March to May; and the rainy or wet-temperate, from June to October. The soil is fertile and capable of raising good crops of all products which are suited to the climate. The most important agricultural products at present are sugar, hemp, and tobacco, each of which is exported in considerable quantities. Rice, Indian corn, coffee, cacao and indigo are also raised to quite an extent.

The most important article of export is manila hemp, which is the fiber obtained from the leaves of the native tree closely related to the banana and plantain. This is the most valuable fiber in the world for the manufacture of rope, cordage, and sacking, and thousands of tons are exported every year. Cocoanuts, pineapples, copra, which is the dried kernel of the cocoanut, and timber are also exported. Some coal is mined on the Island of Cebu and there are also deposits of iron ore, copper, and sulphur, but they have been worked only slightly by the natives in a very primitive manner.

The large islands are all connected by telegraph, and the completion of the American-Pacific cable in 1903 placed Manila in direct communication with the United States over lines which are wholly under American control. There are also about seven hundred miles of railroads. The population is estimated at about nine millions, and is of mixed character. Most of the inhabitants have descended from the Negritos and the Malays. There are about



FILIPINOS GOING TO MARKET IN MANILA



25,000 whites and 50,000 Chinese on the islands. These are engaged in business and industrial enterprises.

The Philippines contain a number of quite important towns, but Manila, the capital, is the great commercial and financial center. It is situated on Manila Bay, on the east coast of Luzon, and has one of the finest harbors on the Pacific Ocean. The harbor now has a large anchorage, and is capable of considerable extension by improvement. The city has a population of about 267,000, and is divided into the old and the new town. The old town is enclosed within a wall, and contains a number of substantial public buildings. The principal manufactures are sugar, cigarettes, and textiles from the native fibers. Its geographical position is such as to make Manila an important distributing center, and is one of the great commercial ports of the East.

The other important cities are, Iloilo, on Panay, with 60,000 inhabitants; Cebu, on Cebu, 60,000; Albay, 40,000; Laoag, 43,000; Nueva Causas, 40,000 — all on Luzon. Zamboanga, with 24,000 inhabitants, is the chief city of Mindanao. All these cities have commercial relations with Manila. Iloilo is the second city in importance and has a profitable trade in hemp, sugar, and tobacco.

By an act of Congress passed in 1916, the government of the islands was placed almost entirely in the hands of the Filipinos. The Governor-General and the Vice-Governor, who is also Secretary of the Department of Public Instruction, the Auditor and Deputy Auditor are appointed by the President of the United States. Both branches of the legislature — the Philippine Senate and the House of Representatives — are elective. The government is divided into six consecutive departments and the secretaries of these departments, with the exception of the Secretary of the Department of Public Instruction, are appointed by the Governor-General, with the consent of the Philippine Senate. Excellent public schools are maintained, and English, Spanish, and the native languages are taught in them. Since these islands came into the possession of the

United States they have advanced rapidly in industrial and commercial importance. With few exceptions, the natives are industrious and law-abiding. Manufactures are being introduced and the prosperity of the Philippines seems to be assured.

**GUAM** This is one of the Ladrone Islands, and was secured by treaty from Spain at the close of the Spanish-American War. It is held as a strategic point, port of call, and coaling station for American ships.

**TUITUILA** This is a small island of the Samoan group and was obtained through treaty with Germany and Great Britain. It is of value as a naval and coaling station. The principal town, Pago-Pago, is situated on an excellent harbor. The commercial importance of this island, like that of Guam, is small, but the shipping interests of the United States in the Pacific make this port one of great convenience, and indirectly one of value.

**VIRGIN ISLANDS** The Danish West Indies, comprising the islands of St. Croix, St. Thomas, and St. John, and having a total area of 134 square miles, were purchased by the United States in 1917 for \$25,000,000 and named the Virgin Islands. These islands are of great value for a naval station, but their commercial importance is comparatively insignificant.

The combined commerce of our island possessions amounts to \$242,000,000 per year.

## QUESTIONS

What has led to the recent development of Alaska?

What American seaports are engaged in trade with Alaska? With Hawaii? With the Philippines?

Of what commercial advantage is Porto Rico to the United States?

What is the most valuable product of Hawaii?

What are the means of communication between Hawaii and the United States? Between the Philippines and the United States?

With what countries is most of the commerce of the Philippines carried on? What proportion of their trade is with the United States?

What is the United States Government doing to improve the condition of these islands?



## CHAPTER XXI

### OUR TRADE WITH OTHER NATIONS

#### DOMESTIC AND FOREIGN COMMERCE COMPARED

The domestic commerce of every nation is greater than its foreign commerce. As we have already seen, the United States, on account of her great extent of territory, diversity of climate, and resources, has an unusually large domestic commerce; and were we compelled so to do, we could supply nearly all of our necessities from our own possessions. But in so doing we should not pursue a wise policy. It is to our advantage to trade with foreign nations for the following reasons:

*First.* Because many of these nations produce what we cannot, as coffee, cacao, and rubber; while others produce commodities more cheaply than we can, such as sugar and hemp.

*Second.* Certain people are naturally better adapted to certain lines of work than others. The French excel in the manufacture of small fancy articles, the Belgians in lace, the Italians in art work, and the Germans in toys and scientific apparatus. These people can produce such articles more cheaply than we, even though they did the work no better.

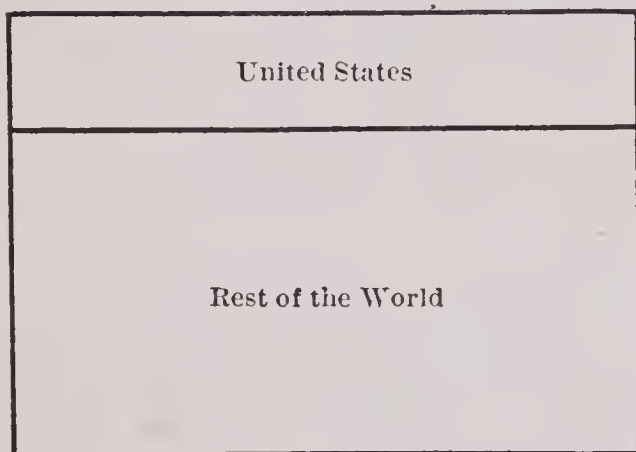
*Third.* We can produce certain commodities that other nations cannot, such as cotton and copper, and we produce many commodities more cheaply or better than other nations can, especially the great food staples, wheat, corn, and meat.

*Fourth.* Interchange of commodities between nations stimulates thought and promotes industry. In all ages commerce has been the greatest promoter of civilization, and nations that refrain

from trading with other nations, or who, unnecessarily, restrict their foreign trade, never take a prominent place among the great powers of the world.

### PRINCIPLES

The same principles govern foreign commerce as apply to domestic commerce. In our trade at home we patronize those who are most conveniently located, and who otherwise meet our demands most satisfactorily, so in trading with other nations, we have the largest proportion of trade with those who are most conveniently located, and with those with whom our exchange of commodities is best suited to our interests. The exports and imports between nations are seldom equal, and



COMMERCE

the difference in value between these is known as the *balance in trade*. The nation whose exports exceed in value its imports, has a balance of trade in its favor, but the nation whose imports exceed its exports has a balance of trade against it. In the first instance the nation may be called a creditor; in the second it is a debtor.

In our commerce with other nations, in late years, the balance of trade has usually been in our favor.

### EXPORTS

Our exports are naturally from those commodities that we produce in the largest quantities. The first use of all products is that for home consumption, then the surplus, if any, is sent to foreign markets. For this reason we shall find nearly the same commodities from the United States in all countries with which we have trade, although they vary somewhat in relative proportion. The nations of Europe and Asia use more of our manufactured iron and steel than do those of the tropical regions; while the nations of the tropics use relatively larger



quantities of our cotton goods than the nations of Europe which do their own manufacturing.

While our exports include between seventy and one hundred commodities, those having great value are comparatively few in number. In order of their importance they are, agricultural products, including food produce, raw material and domestic animals; manufactures, including iron and steel, cotton goods, forest products, leather and leather manufactures; petroleum and other oils, and manufactured tobacco. The total value of our exports for the year ending June 30, 1921, was \$6,516,315,346. Our imports for the same period were \$3,654,402,869. Our agricultural implements tools, machinery and railway appliances are found in nearly every civilized country on the globe; our cotton goods go to all countries except those of Europe and British India, and our boots and shoes have an extensive sale. In relative importance our exports are as follows:

	PER CENT
Agricultural Products . . . . .	62.73
Manufactures . . . . .	29.28
Forest Products . . . . .	4.16
Mining Products . . . . .	2.81

**IMPORTS** Our imports are of a more varied character than our exports, since we obtain from each country its principal products which we can secure to our best advantage. From the tropical countries of South America and the West Indies we import coffee, cacao, sugar, rice, tobacco, rubber, cinchona and various other drugs; and from other tropical regions we obtain spices, gums and drugs. Most of our coffee comes from Brazil, and all of our rubber from South America, Central America and Mexico. Raw material in the shape of hides, wool and fiber is also imported from these countries.

From Europe we obtain raw material for manufacturing, such

as iron, yarns and numerous other articles that are partially manufactured. We also import from European countries many manufactured articles, such as woolen and silk goods, ribbons, gloves, scientific apparatus and numerous small articles, like steel pens and cutlery, from England, jewelry from France and art work from Italy.

From China and Japan we obtain most of our tea and raw silk, and from India, tea, certain varieties of cotton goods, Indian rugs, and other manufactures peculiar to that country. From Australia we obtain wool and hides. Our trade with Africa is small, and while American machinery and a few other products are exported in considerable quantities to this continent, our imports from African countries are very light.

The bulk of our foreign trade is carried on with the European nations; The United Kingdom, Germany, France, Belgium and Netherlands in the order named, being the most important. Europe takes about three-fourths of our exports, and furnishes us with about one-half of our imports. Many of the exports to European countries, especially to England, are not used there, but are sent on to Asiatic, African and even South American people. Of the other nations, Canada is the most important in North America, Brazil, Argentina and Chili in South America, and Japan and China in Asia. In the order of their value, our imports are sugar, coffee, chemicals and drugs, hides and skins, cotton goods, iron and steel manufactures, raw silk and silk goods. In their relative proportions they are as follows:

	PER CENT
Raw Material . . . . .	.38
Food and Domestic Animals . . . . .	.21
Manufactures. . . . .	16.79
Luxuries . . . . .	14.47

## TRANSPORTATION

The map of ocean routes shows that the leading Atlantic ports have numerous lines of



steamers plying between them and Liverpool, Hamburg, Bordeaux and other important European cities, and that San Francisco, Seattle, Portland and Tacoma have important lines of steamers connecting them with the Hawaiian Islands, the ports of Japan and China, the Philippine Islands and Australia.

Previous to the World War, only a small part of our foreign trade was carried in American ships; British, French and German vessels on the Atlantic and Japanese ships on the Pacific Ocean did most of our carrying trade. Since the manufacturing industries of the country are now able to produce much more than we can consume at home, it is to our advantage to seek foreign markets, and this can be done with an American Merchant Marine much more successfully than is possible when we are under the necessity of employing foreign ships, because the ships of each nation try to promote the trade of their own country. The principal reasons for the pre-war conditions of American shipping were: the Civil war occurred just at the time when steel ships were replacing those of wood and all the attention of the country was directed to war. After the War we gave so much thought to the development of our internal resources that the building of ships for foreign trade was neglected.

European nations were alive to their opportunity, and during these periods secured control of most of the ocean-carrying trade. No measures that the government seemed able to devise succeeded in the development of an American Merchant Marine. When the United States entered the World War, American owned ships became a vital necessity, and such strenuous efforts were made to supply the need that in 1920 the United States had a merchant marine second only to that of Great Britain, and American ships were carrying more than one-fourth the foreign commerce of the country. Since it is the plan to sell government-owned merchant ships to Americans as far as practicable, it is probable that our merchant marine will continue to increase.

## QUESTIONS

Why should the domestic commerce of a nation exceed its foreign commerce?

Show how commerce promotes civilization.

Why do we import iron and cotton and woolen goods, when we are constantly exporting these commodities?

With what European ports does New York have direct steamer connections? Does Boston have connection with the same ports?

Why is such a large proportion of our foreign trade carried in the ships of other nations?

What has contributed to the rapid increase of our commerce with China and Japan?



## CHAPTER XXII

### COMMERCIAL GROWTH OF THE UNITED STATES

The first census of the United States was taken in 1790. At that time the western boundary of the country was at the Mississippi River, and the area was 892,135 square miles, only a small portion of which was settled, and this constituted a narrow strip of land extending from Maine to Georgia, and from the Atlantic coast to the Appalachian Mountains. Our population was only half a million more than the population of New York City in 1900, and was exceeded in our last census by the population of each of the following states: New York, Pennsylvania, Illinois, and Ohio. In 1790 there were only three cities that were worthy of the name: Philadelphia, New York, and Boston, and these were scarcely more than good-sized villages. There was no such thing in the world as a railroad, a steamboat, or a telegraph. Even carriage roads were few, and so poor that they were impassable a good portion of the year. The country possessed only nine hundred postoffices, and the annual receipts of the postal department were about \$281,000. Less than fifty newspapers were published in the entire country.

The nation was burdened with a debt that was equal to \$15.63 per capita. The total amount of coinage was a little over half a million dollars. There were no banks under national supervision, and the value of our manufactures was so small that it did not appear in the census report. The annual revenue of the government was about \$10,849,000. Our imports amounted to \$91,250,000 and our exports to about \$71,000,000, making our entire foreign trade about \$162,250,000.

Our industries had been ruined by a long war; our currency

was worthless, and our credit gone. The only industry at all comparable with those of foreign nations was our carrying trade. We had over 100,000 vessels and two-thirds of our tonnage was engaged in foreign trade. No patents were issued, no immigrants arrived, and the nations predicted the speedy downfall of the new republic.

The condition of the nation at the census of 1920 shows a progress during the intervening period unequalled by that of any other nation in the world's history. From a little over three-fourths of a million square miles our territory increased to 3,025,600 square miles, or over three and a half times. From the narrow area occupied by our forefathers at the close of the Revolution, American settlements and institutions have extended more than half the way round the world, and the extent of our Pacific coast line exceeds the distance from New York to San Francisco.

The last census shows that at the end of the second decade of the twentieth century the United States had about 1000 cities of 5000 or more inhabitants and that of these 68 had a population of 100,000 or over.

The census of 1830 reported twenty-three miles of railway in operation, and that of 1910 reported 207,977 miles, which number has since been increased to over 253,000 miles. We now have over 52,000 postoffices, and the annual receipts of the postoffice department exceed \$463,491,000. In 1790 there were less than fifty newspapers in the country, and in 1910 this number had increased to 22,725. Telegraph messages were not reported until 1870, when they exceeded 9,157,000, and in 1900 this number had increased to over 63,258,000, and in 1918 the number was 155,263,206, an increase of nearly tenfold in thirty years. The first telegraph line was completed in 1844, and extended between Washington and Baltimore, a distance of forty miles. In 1900 the country had over 933,000 miles of lines, and these have now



been extended to exceed 2,020,000 miles. The first public experiment with the telephone was made at the Centennial Exposition in Philadelphia in 1876. In 1920 there were in the country, 22,137,480 miles of telephone lines, 8,333,980 stations, and the daily exchanges exceeded 33,102,000.

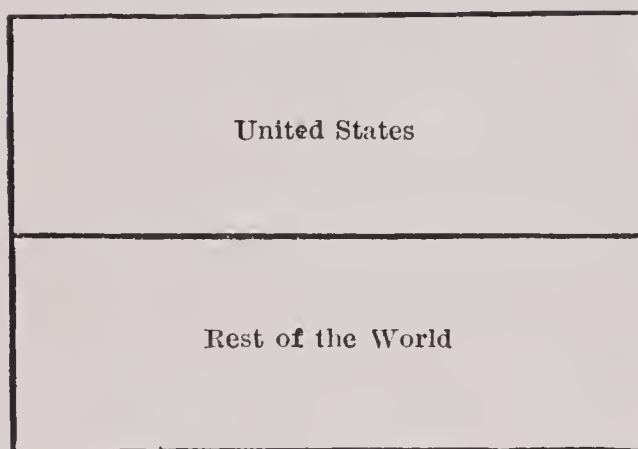
In 1921 the gold coined in the country exceeded \$76,990,000, and the money in circulation amounted to over \$5,774,065,654, or \$53.42 for every man, woman, and child in the country. There were 8154 national banks, with a capital of \$1,220,781,000 and the bank clearings amounted to \$462,920,250,000. The ordinary receipts of the government for the fiscal year ending June 30, 1921, were \$4,109,000,000, and the expenditures were \$3,795,000,000. The domestic animals in the United States January 1, 1921, were valued at \$6,236,069,000. Our agricultural products and our manufactures exceed in value those of any other country. Soon after the outbreak of the great war in Europe, the United States became a creditor nation, and during the war she loaned billions of dollars to Great Britain, France, and Russia.

The United States began the twentieth century under exceedingly favorable conditions. The period from 1870 to 1900 had witnessed remarkable progress running through all lines of industrial and commercial activity. Our industrial and commercial position in the world is shown by the following comparisons. We produce five-sixths of the cotton, one-sixth of the wool, three-fourths of the corn, one-fifth of the wheat, one-third of the coal, one-fourth of the cattle, one-half of the hogs, a little more than one-third of the iron and steel, two-thirds of the copper, one-fifth of the silver, one-half of the gold, one-half of the tobacco, one-third of the lumber, one-third of the manufactures, and one-fourth of the commerce of the world.

In manufactures we lead the world, and our manufactures exceed those of the United Kingdom and Germany combined.

who stand next to us as the two greatest manufacturing nations. We own nearly one-half of the railway mileage and more than one-half of the telegraph and telephone lines of the world. Our total commerce is exceeded only by that of Great Britain, and our trade with foreign countries is steadily increasing.

The geographical position of the United States is such that it is especially favorable for international trade. Situated between



TOBACCO

the two oceans we have equal facilities for trade with the countries of both Europe and Asia, and our position in the Pacific Ocean gives us an excellent opportunity to increase our traffic with this part of the world. There is a widespread interest in industrial and commercial education, and the schools of the coun-

try are each year sending out thousands of young men specially fitted for a business career.

Our greatest hindrances are the lack of training among our consuls and commercial representatives abroad, the unwillingness of the great majority of American manufacturers to study intelligently the needs of foreign countries and to make such goods as the inhabitants of those countries desire. This is especially true of our inability to adapt our manufactures to the wants of the people in tropical countries. Under the stimulus given it by the World War, our merchant marine has rapidly increased and American ships are now found in every important port in the world. Our foreign commerce is steadily growing.

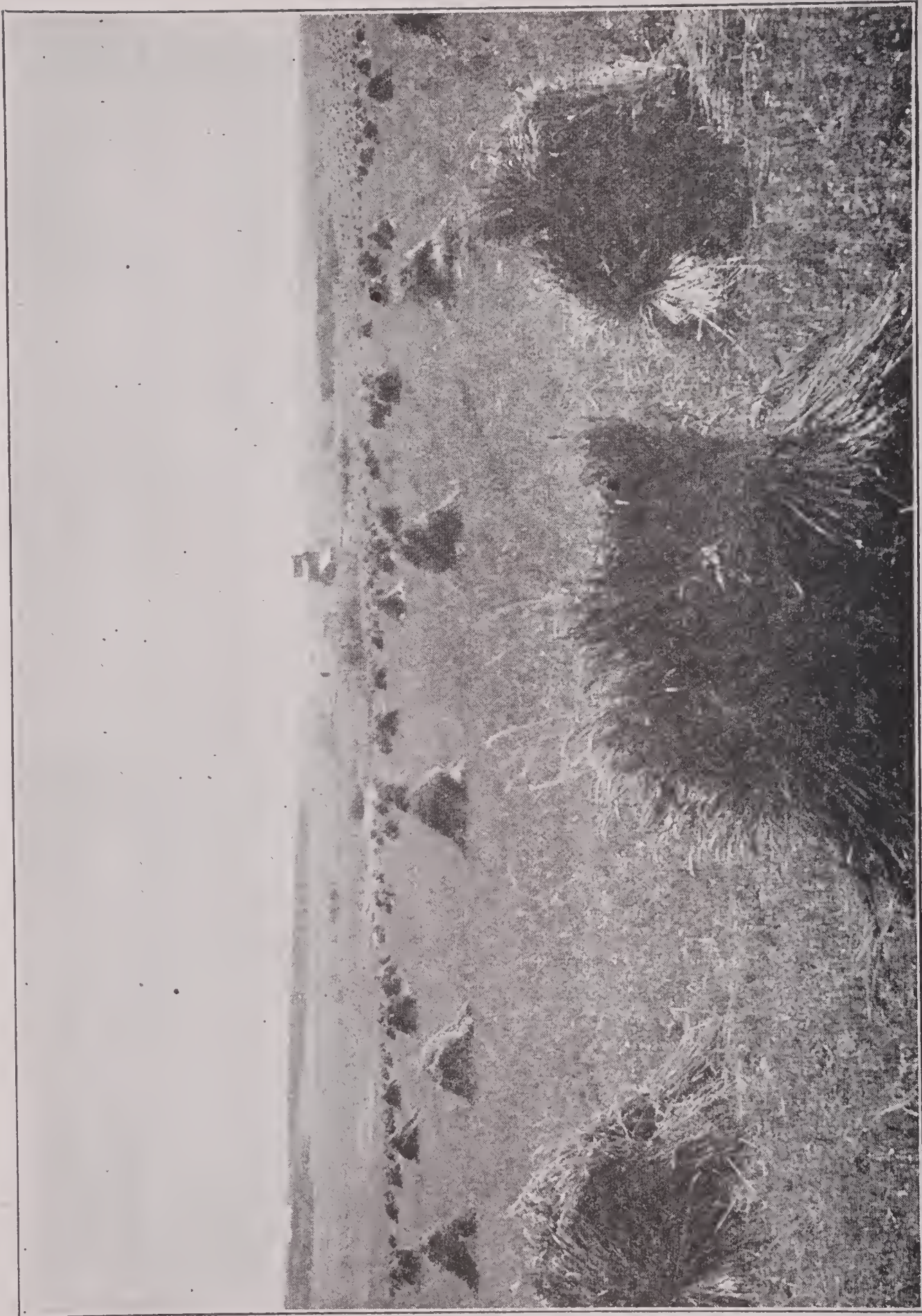
Since our acquisition of Hawaii, the Philippine Islands, Porto Rico, and the Virgin Islands, our expansion as a world power has been rapid. Escaping most of the calamities that befell the European na-



tions, the United States at the signing of the Armistice in 1918 was the leading nation of the world in wealth, in manufactures, and in commerce. Through financial stress of 1920 and 1921, she maintained her position, and there is every prospect that she will continue to be the world's example in the arts of peace.

### QUESTIONS

Why did the United States become a creditor nation during the World War?  
What geographic conditions favor the foreign commerce of the United States?  
How does the American merchant marine compare with that of other nations?



WHEATFIELD, ALBERTA



## PART TWO

### COMMERCE OF FOREIGN NATIONS

Foreign countries in their trade with the United States and with each other are governed by the principles laid down in the discussion of the commerce of our own country. They buy what they can not produce, or what other countries can produce better or more economically, and sell what they can produce in the largest quantity and to their greatest economical advantage.

#### CHAPTER I

#### DOMINION OF CANADA

##### LOCATION AND AREA

Canada, the most important Dominion of the British Empire, occupies all the mainland of North America north of the United States, except Alaska and Labrador. The Dominion's greatest extent from east to west is 2700 miles and from north to south 1600 miles; the area, 3,729,665 square miles is equal to nearly one-half the continent of North America. It is a little larger than the United States and a little smaller than Europe. Including the portion of the Great Lakes that belong to Canada 125,755 square miles of this area is water surface. The total area given above, however, does not include Hudson Bay, 443,750 square miles and the Gulf of St. Lawrence, 101,562 square miles.

This vast area comprises the following provinces and territories:

PROVINCE	SQUARE MILES
Alberta .....	255,285
British Columbia .....	355,855
Manitoba .....	251,832

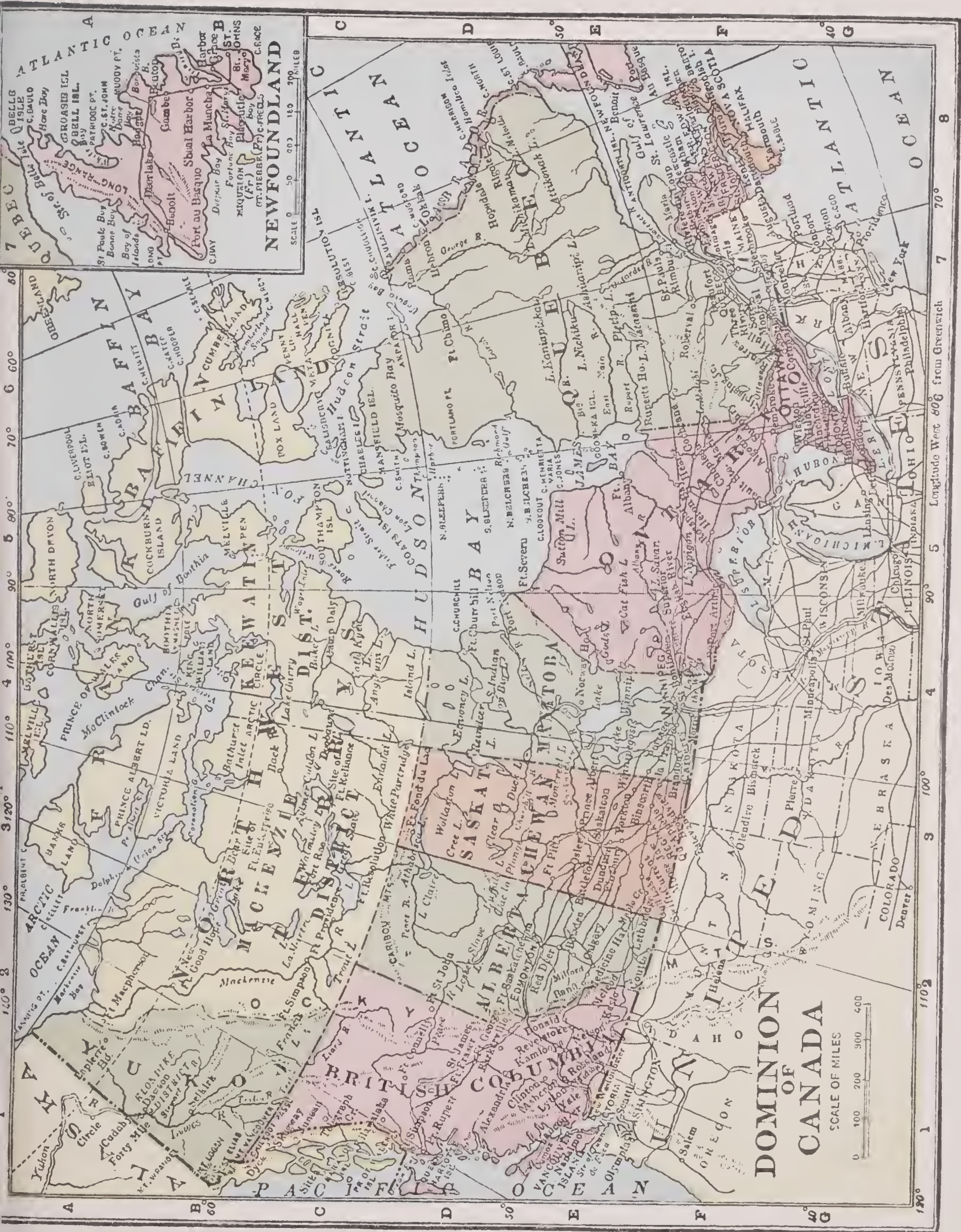
New Brunswick .....	27,985
Nova Scotia .....	21,428
Ontario .....	407,262
Prince Edward Island.....	2,184
Quebec .....	706,834
Saskatchewan .....	492,432
Northwest Territories .....	1,242,224
Yukon .....	207,076
<hr/>	
Total .....	3,729,665

The St. John River forms the boundary between New Brunswick and Maine, thence an irregular line extends southwest to the Connecticut River, then the boundary follows the forty-fifth parallel westward to the St. Lawrence River. From this point the deepest channel through Lakes Ontario, Huron and Superior and the Pigeon and Rainy Rivers form the boundary to the Lake of the Woods. From this lake to the Pacific Coast the forty-ninth parallel of north latitude is the dividing line between the Dominion and the United States. The crest of the Rocky Mountains forms the natural boundary between Canada and Alaska and the range forming this border includes some of the highest peaks in North America.

**SURFACE** The surface of Canada is divided into three great regions—the Eastern Highlands, the Central Plain, and the Western Highlands and Coast Region.

**Eastern Highlands** Eastern Highlands includes all the region from Labrador to Hudson Bay and a small area west of that body of water. The highest points in this section, about 8000 feet above the sea, are in Labrador. But from Labrador westward the plateau descends rapidly and the greater part of Northern Quebec has an altitude of 2000 feet or less. The most of this interior consists of a succession of low rocky ridges covered with light forests or barren.





**DOMINION OF CANADA**

SCALE OF MILES



Longitude West 80° from Greenwich





Between the ridges are valleys containing lakes, swamps, and rapid streams whose cascades and waterfalls lend interest and charm to the scenery and form sources of future water power. A low ridge or "height of land" separates the streams flowing into Hudson Bay from those flowing into the St. Lawrence.



VICTORIA BRIDGE, MONTREAL

The valley of the St. Lawrence is the outstanding geographic feature of Eastern Canada. The entire valley is noted for its fertile soil and temperate climate and this valley and the southern part of Ontario are the most densely populated sections of the Dominion. As the St. Lawrence approaches its mouth the valley is narrowed by the Gaspé Peninsula which is a part of the Appalachian Mountain system.

**The Central Plain** The Central Plain occupies the region between the eastern and western highlands. At the international boundary it is about 700 miles wide, but it narrows to 400 miles at the northern border. The divide separating the streams

of the Mississippi system from those flowing into Hudson Bay is near the international boundary and all the large rivers lie wholly within Canadian territory. Some of the rivers have worn channels from 100 to 200 feet deep, forming small canyons. This region comprises the northern part of the Great Central Plain of North America and is characterized by the same general features as are found in the Dakotas. The highest elevation, about 4500 feet, is in the southwestern part of Alberta; the general surface of the plain is flat and in the northeast there are so few elevations that even a low hill is likely to be called a "mountain." The northern part of the region is covered with forests, but the southern portion is treeless, except along the banks of streams. The surface is covered with a deep fertile soil and this part of Canada has become one of the great wheat-producing regions of the world. It includes the provinces of Alberta, Saskatchewan and Manitoba. This region is the destination of a great majority of the immigrants, and the population is rapidly increasing.

### **Western Highlands**

The third great topographical division includes British Columbia, Yukon and the western part of Alberta. It comprises a part of the northern extremity of the great Cordillera, which extends the entire length of the American continent. The western Highlands consist of parallel ranges separated by broad or deep valleys. The Eastern slopes of the mountains are gradual, but in most places the western slopes are precipitous. The summits cool the moisture-laden winds from the Pacific and the western slope is subject to heavy rainfall. Because of their latitude many of these mountains are capped with perpetual snow. Glaciers fill most of the mountain gorges, beautiful lakes are found in the valleys and the region is widely known for the beauty and grandeur of its scenery. Excepting Mount Logan in Yukon (19,539 feet), the highest point in Canada, none of the summits exceeds 11,000 feet in altitude. The streams furnish abundant water power and fruit is successfully grown in the valleys.



**CLIMATE**

The climate of Canada as a whole varies from temperate to sub-Arctic and Arctic. But in a country so vast, there are many variations in temperature and rainfall, due to local conditions. Throughout the Dominion the weather is bracing summer and winter and there are many bright clear days. The winters are severe with a heavy fall of snow. Summer is short, but the days are long, and in the north the sun shines twenty hours out of the twenty-four. Vegetation grows rapidly and all crops suited to a cool temperate climate mature as far north as the Peace River valley.

The climate of the Maritime provinces is affected by the warm currents in the Atlantic Ocean. Fogs are frequent and rainfalls heavy. This region and that part of Ontario between Lake Ontario and Lake Huron have a more equable temperature than any other parts of the Dominion, and they are well suited to the production of fruit. Apples, pears, plums and small fruits are grown in abundance.

Northern Quebec and Ontario have an attractive summer climate and here are found many delightful resorts for tourists. The prairie provinces have a typical continental climate—long cold winters and short hot summers. This region is especially suited to the production of grain, vegetables and live stock. Because of the warm current in the Pacific Ocean, British Columbia has a milder climate than other portions of the Dominion in the same latitude. The moisture-laden winds from the ocean are cooled as they strike the high mountains and lose most of their moisture. On the western slopes the rainfall is heavy, while the eastern slopes have little or no rain. In western Alberta the severe winters are modified by the Chinook, a warm, dry wind that blows down the mountains.

**MINERALS  
AND MINING**

The eastern and western highland regions are continuations of the Appalachian, the Rocky and the Coast ranges respectively and the same minerals found in these mountains in the United States exist in corresponding parts of Canada. There is also a third mineral region north of Lake

Superior. Canada is rich in minerals but development of the mining industry has scarcely begun.

**Coal** At present, coal is the most valuable mineral product. Large deposits of bituminous coal are found in Nova Scotia and this province leads in the production of coal, the annual output averaging from 6,000,000 to 7,000,000 tons. About two-thirds of this coal is shipped by water to Boston and other New England ports, some is used to supply local demands and some goes westward to supply fuel for the inhabitants of Quebec and Ontario.

The mines of British Columbia produce from 2,000,000 to 3,000,000 tons a year and those of Alberta about 4,000,000 tons. Alberta contains rich deposits of semi-anthracite. The coal measures of Alberta are estimated to be larger than those of any other province. The output of all mines in these provinces is used to supply local needs. These are rapidly increasing with the increase of population and the expansion of manufactures.

**Petroleum** The oil fields in Ontario between lakes Erie and Huron are the chief source of petroleum in Canada and most of the petroleum and petroleum products used in the country are imported from the United States. Prospectors for petroleum are active in Alberta and in 1921 an oil field was discovered on the Mackenzie River near the Arctic Circle, but the oil from this source is not yet available because of lack of transportation facilities.

**Gold and Silver** The richest gold and silver mines of Canada are in the Porcupine district in Ontario, about three hundred miles north of Toronto. This is the richest silver producing region of Canada and one of the richest silver regions of the world as well. Large quantities of lead are obtained in smelting the silver ore.

There are valuable gold mines in British Columbia and in the Klondike region in Yukon, but the production of the Klondike mines has fallen off rapidly in the last few years. There may be traces of



gold and silver in the other provinces but no deposits of sufficient value to pay for working them have been found.

**Other Minerals** The mines near Sudbury, Ontario, produce most of the world's supply of nickel, and about four-fifths of the asbestos comes from the Province of Quebec, the principal mines being near Thetford. Iron ore is found in every province, but only a small quantity of iron and steel are produced, although the world war gave considerable stimulus to the industry. Copper occurs in the southeastern part of Quebec, on the north shore of Lake Superior and in British Columbia. Copper mines are active in all these localities.

**FORESTS** No other lumber-producing country contains such extensive forests as Canada. The forest areas extend in an unbroken belt from Nova Scotia and New Brunswick across the country to the Pacific coast in British Columbia and northward. There are about 500,000,000 acres or 780,000 square miles of forest in this area, over half of which is covered with merchantable timber.

In the eastern section of this belt the principal trees are red and black spruce, red and white pine, balsam fir, tamarack and hemlock. In British Columbia the Douglas fir is the chief source of lumber supply. Ottawa is the chief center of the lumber industry, and obtains its supply of timber from the pine forests to the north and northwest. Extensive mills are also found on Parry Sound and Georgian Bay. Most of the lumber of this region is exported to the United States by the way of the Great Lakes. The lumber manufactured in New Brunswick and Nova Scotia finds a market in the New England States. The forests of this region also supply considerable wood pulp and pulp wood. The lumber of Quebec and a portion of that of New Brunswick is exported to England, while the British Columbian mills find a market for their surplus product in trade with the Pacific towns of the United States. The manufacture of wood pulp has become a thriving industry and the annual export of this product to the United States amounts to about \$85,000,000.

**FISHERIES**

The fisheries of Canada are extensive and valuable. They furnish employment for about 85,000 men, and in 1920 the fish marketed amounted to nearly \$50,000,000. In addition to the Arctic coast, Canada has over 5000 miles of coast line on the Atlantic and over 7000 miles on the Pacific; everywhere the coast waters abound in fish. There are also 220,000 square miles of fresh water including the Canadian portion of the Great Lakes which is a valuable source of fresh water fish. There are more than forty varieties of food fish in Canadian waters, but only a few are of economic interest. These are in the order of their value: salmon, cod, halibut, herring and lobster, among the salt water fish; and lake trout, white fish and sturgeon among fresh water fish. Salmon, the most of which is taken in British Columbia, is of first importance and its value is nearly twice that of any other species; then follow in the order of their values cod, halibut, herring, and lobster. Lake trout and whitefish are the most valuable of the fresh water fish. Fish shipped to distant markets are packed in ice or sent in refrigerator ships or cars.

**FURS**

Since the advent of the early French settlers, Canada has been one of the leading fur countries of the world, and the great forests of the interior still furnish a good supply, since every animal of the forests is a fur-bearing animal. The hunters travel the woodlands during the winter and in the spring bring their pelts to the trading posts to exchange them for food, clothing and such other commodities as they may need. Edmonton, Alberta, is the chief center of this traffic. Previous to the World War the more expensive skins were sent to England for dressing, but much of that work is now done in the United States and Canada. The fur trade is in control of the Hudson Bay Company, which formerly held political sway over a vast area in British America.

In Prince Edward Island, Nova Scotia, New Brunswick and some parts of Quebec, fur farming has become a paying industry. Black and silver foxes are given the most attention because their skins are



the most valuable. A prize skin is frequently sold for more than \$2000 and choice animals sell for as much or more for breeding purposes. Other varieties of fox, mink, raccoon, skunk, lynx and other animals are also raised for their fur. In 1920 there were 16,530 animals on fur farms, and their aggregate value was \$4,723,000.

## AGRICULTURE

Canada is naturally an agricultural country, and about three-fourths of the people are farmers, but a large portion of tillable land in the interior is still undeveloped. Soil, climate and markets vary so widely in parts of the country far distant from each other that the conditions and opportunities for agriculture are more easily understood, if we divide the provinces into two great groups—Eastern and Western.

**Eastern Group** This group includes the provinces between the Atlantic Ocean and Manitoba, or the Maritime Provinces, Quebec and Ontario. In these older provinces agriculture has naturally reached a more complete stage of development. The regions representing the highest state of cultivation include Prince Edward Island, some of the sheltered valleys of New Brunswick and Nova Scotia, the valley of the St. Lawrence above Quebec and the southern part of Ontario, especially the peninsula between Lakes Ontario and Huron. Because of its high state of cultivation, and variety of products, this region is known as the "Garden of Canada." The provinces in this group are better known for a variety of crops and diversified farming, than for the value of their entire output. New Brunswick and Nova Scotia are noted for their apples, and the Annapolis Valley, Nova Scotia, and St. Johns' Valley in New Brunswick are among the most celebrated apple regions of the world. Potatoes and vegetables also receive special attention in these provinces. Quebec exceeds all the other provinces in its dairy products and especially in the production of cheese.

Considerable attention is given to raising live stock, and excellent breeds of cattle, horses, sheep and swine are found, especially in Ontario, which is widely known for its cattle

**The Western Provinces**

The western provinces include Manitoba, Saskatchewan, Alberta and British Columbia. In the three provinces first named, conditions are similar to those in Minnesota and North Dakota. The great stretches of prairie are adapted to farming on a large scale, and in general, large farms worked by machinery and producing large crops constitute the chief agricultural characteristic of this region. Farmers specialize on a few crops and the variety of crops found in the eastern provinces is lacking. These provinces are especially suited to the production of spring wheat and they have become one of the great wheat-producing regions of the world. A five year average of production (1915-1919) in these provinces was 15.11 bushels per acre, which is higher than the average of any other wheat-producing country except the United Kingdom for the same period. In 1920 the wheat crop in these three provinces amounted to 234,138,000 bushels distributed as follows: Manitoba, 37,542,000 bushels; Alberta, 83,461,000 bushels; Saskatchewan, 113,135,000 bushels. Ontario, with a production of 22,973,000 bushels, is the only eastern province that approaches them.

This wheat is marketed in the United Kingdom, the eastern provinces and the United States. That shipped eastward is carried by rail to Port Arthur and Fort William, Ontario, where there is one of the most commodious harbors on the Great Lakes. Then it is transhipped by boat. These towns have the largest elevators in the world and their combined storage capacity in 1923 was 65,000,000 bushels. The wheat crop of Canada in 1921 amounted to 300,858,100 bushels, valued at \$242,936,000.

Oats, barley, rye and potatoes are also important crops. Dairying is a valuable and rapidly growing industry and butter and cheese are made in large quantities. These provinces also take high rank in the number and quality of their live stock. Some sections are especially adapted to the live stock industry because of mild winters and their excellent conditions for grazing.



In its agriculture, British Columbia more closely resembles the states south of the international boundary—Washington, Oregon and the northern part of California. The farm lands are located in the river valleys and soil and climate are suited to raising a variety of crops. Farms are smaller than in the prairie provinces and some localities are noted for the quality of their apples, pears, peaches and small fruits.



THE HARBOR, QUEBEC

## MANUFACTURES

The World War gave an impetus to the manufacturing industry that in a measure is still active. The great demand for capital to develop natural resources and construct railways, and ability to purchase many manufactured products in the United States and the United Kingdom at less expense than they can be manufactured at home, have prevented a rapid development of manufacturing industries, but the progress from 1911 to 1921 was greater than during any previous decade.

Naturally the manufacturing industries of Canada are engaged in working up the raw material at hand. In 1920 the six leading industries in order of value of their products were flour and gristmill products, slaughtering and meat packing, lumber, wood pulp, butter and cheese and refined sugar. Other important industries include building and construction, shipbuilding, cotton fabrics, automobiles, boots and shoes, and electric light and power.

The chief manufacturing region is in the southern part of Ontario and Quebec. The chief water power and the bulk of the population are there and this region has ready access to markets and ample transportation facilities. Montreal is the leading manufacturing and commercial center of the Dominion. Large sugar refineries, foundries and machine shops, cotton mills, boot and shoe factories and many other industries are located there.

In 1919 there were over 11,000 manufacturing establishments in the province. The chief manufacturing centers are located along the St. Lawrence and in the eastern townships. Chicoutimi, at the head of navigation on the Saguenay River, has extensive pulp mills and ships annually over 60,000 tons of dry pulp to England. Toronto and Hamilton are the chief manufacturing centers of Ontario and at Niagara Falls is one of the largest hydro-electric plants in the world.

At least half of the manufacturing industries of the Dominion are located in Ontario, including the most of the American branch factories which firms in the United States have established in Canada.

The manufactures of western Canada are as varied as those of the older eastern provinces, but the output is smaller, since their chief purpose is to supply local demands. Winnipeg, Manitoba; Regina, Saskatchewan; Calgary and Edmonton, Alberta, and Vancouver, British Columbia are the chief industrial centers of these provinces. The geographic position of British Columbia and its potential water power make it a desirable location for manufacturers whose product is shipped to China, Japan and other oriental countries.



**TRANSPORTATION**

The Dominion of Canada has over 30,000 miles of railway which is a larger mileage per capita of population than is found in any other country except the commonwealth of Australia. This mileage comprises three great transcontinental systems, which with their branch lines and feeders provide transportation for the greater part of the country. They are: the Grand Trunk, which with the Grand Trunk Pacific extends from Portland, Maine, to Prince Rupert in British Columbia. The Inter-colonial extending from Halifax, Nova Scotia, to Montreal, a distance of 1450 miles. The route is along the south bank of the St. Lawrence. The Canadian Pacific originally extending from St. Johns, New Brunswick, to Vancouver, British Columbia. This railway was completed in 1885, and was constructed to connect British Columbia with the eastern provinces and to secure that province as a member of the confederation. The system has been extended until it now comprises over 12,000 miles, including lines to Boston and Chicago.

The Canadian Northern extending from the city of Quebec to the Pacific coast over a route north of the St. Lawrence through the provinces of Quebec and Ontario, and westward from Winnipeg through a region far north of the other transcontinental lines. The system includes about 6600 miles and it has opened up to settlement a vast region hitherto inaccessible. A branch from Pas on the main line to Port Nelson on Hudson Bay, will soon open a new and shorter route to Europe during the summer months.

These great transcontinental railways have been the pioneers in the development of the prairie provinces and British Columbia. The settlers have followed the railway, without which this great productive region would doubtless have remained in a state of nature for many years. The Intercolonial, Grand Trunk Pacific, and Canadian Northern are operated by the government, under the name of Canadian National Railways. The great railway centers in the eastern provinces are in Quebec, Montreal; in Ontario, Toronto, Hamilton, London,

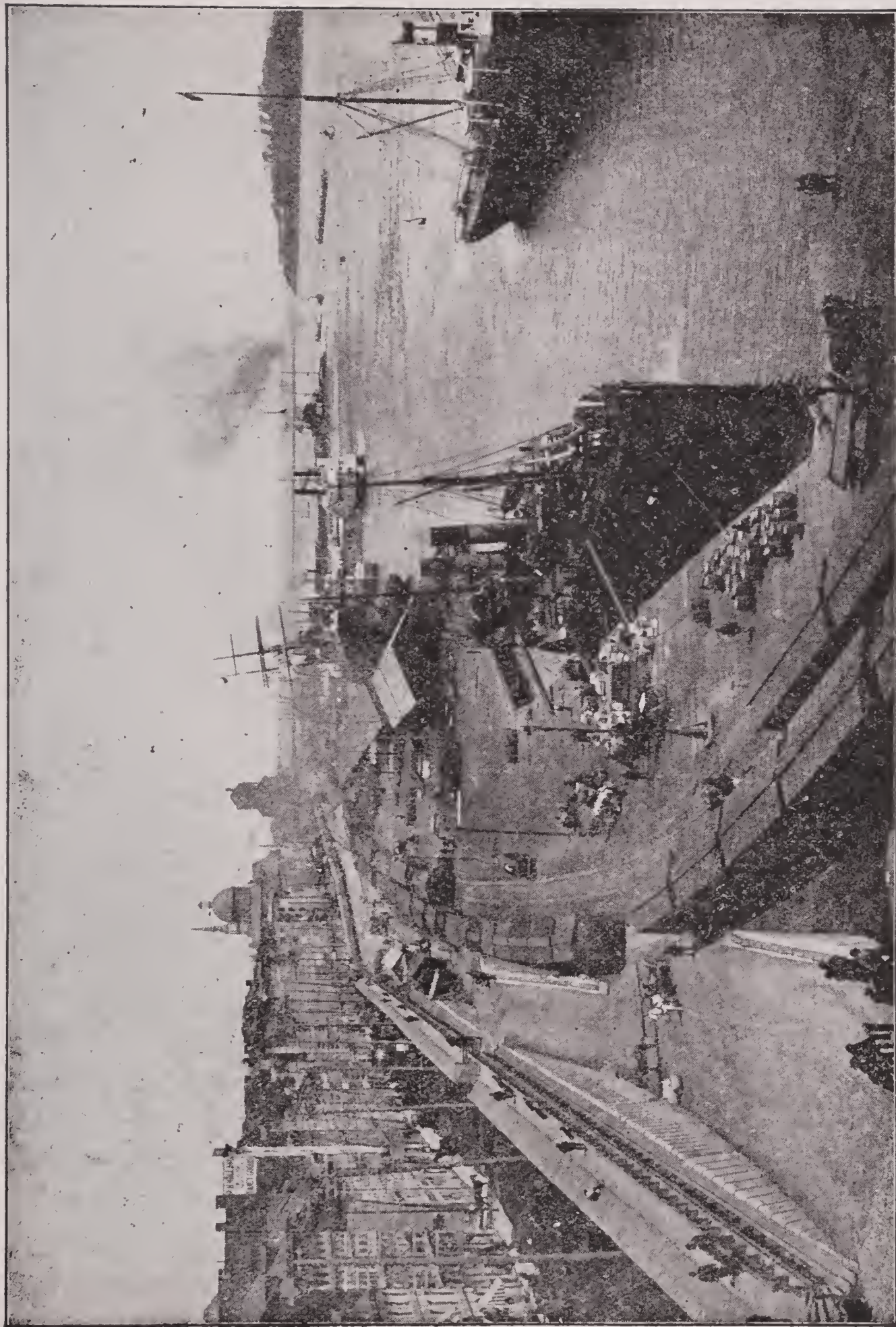
Niagara Falls and Sarnia. In the western provinces Winnipeg, Manitoba; Regina, Saskatchewan; Calgary and Edmonton, Alberta, and Vancouver, British Columbia.

**Waterways** Ever since Canada has been known to white men, the St. Lawrence River has been the great natural highway to the interior of the country. Excepting a few months in the winter, when the river is frozen over, ocean ships ascend it as far as Montreal, where they take cargoes of grain and other produce brought from the western provinces by rail or by boats navigating the Great Lakes for the river is navigable its entire length for boats of fourteen foot draught. The Saguenay, the Great Northern tributary is navigable to Chicoutimi in the heart of the lumber country. A canal around the rapids in the Richilieu at Chambly enables boats to pass between Lake Champlain and the St. Lawrence. Canals around the rapids in the St. Lawrence between Lake Ontario and Montreal enable freight boats to pass up or down the river; the Welland Canal overcomes the fall between Lake Erie and Lake Ontario, and the Canal at Sault Ste. Marie overcomes the falls in the Saint Marys River as it leaves Lake Superior. There is an unbroken waterway from the Atlantic Ocean to every port on the Great Lakes. The Rideau Canal extends from Ottawa to Lake Ontario at Kingston, and the Trent Canal consists of a chain of lakes and canalized rivers connecting Georgian Bay with Lake Ontario. This canal shortens the distance between the points named, and is very popular with boats of light draught; over 5,000 vessels used it in 1921. With the completion of the proposed improvements in the St. Lawrence canals Canadian lake ports will have direct connection with Europe.

Halifax is the most important harbor on the Atlantic Coast, and Vancouver and Prince Rupert, are the leading seaports on the Canadian Pacific coast.

From all viewpoints, Canada has excellent transportation facilities, except in some of the most sparsely settled regions along the northern frontier and here conditions are improving each year.





THE WATER FRONT, MONTREAL



**COMMERCE**

The foregoing descriptions of Canada and her resources shows us definitely the nature of her commerce. The great stores of raw material must reach manufacturing centers where this material is converted into a variety of useful products. These products in turn must reach the consumer. Since the great manufacturing centers of the world and the most densely populated regions lie outside the Dominion, it naturally follows that Canada has a large foreign commerce. In 1921 the imports for consumption amounted to \$1,249,158,882, and the exports to \$1,189,163,701. This shows that Canada buys from foreign countries a little more than she sells to them. Over thirty countries are represented in this trade. Over one-half the entire amount is with the United States and about one-third with the United Kingdom, then follow, in order of importance Cuba, France, British West Indies, British East Indies, Switzerland, Mexico and Japan. The trade with other countries is small.

Because of Canada's geographic position the ocean routes to Europe and to the Orient are shorter than those leading to and from ports in the United States, and this advantage is realized by Canadian shippers. The Canadian Pacific Railway has its own lines of ships plying between Montreal and Quebec and European ports, and between Vancouver and the ports of China and Japan. The great railway and steamship lines are engaged in an extensive carrying trade for firms in the United States and other countries, as well as in transporting the commodities of the Dominion.

The great trade centers, beginning on the Atlantic coast and traveling westward are: Halifax with its magnificent harbor open the entire year. Halifax is 616 miles nearer Liverpool than is New York. Why? Passing up the Gulf of St. Lawrence, soon after entering the broad estuary of the river we come to the city of Quebec which has an excellent harbor. Further on is Montreal at the head of navigation for ocean going ships. Here ships from Europe meet railway trains from



across the continent and exchange cargoes with them. Montreal is the metropolis and largest trade center of the Dominion.

Next to Montreal in its volume of trade is Toronto, the capital and metropolis of Ontario. Following Toronto, is Ottawa, the capital of the Dominion, and noted for its extensive lumber trade. Hamilton and London in Ontario are also important. Winnipeg is the great railway and trade center of Manitoba and the third city in the Dominion, measured by its volume of business. Regina is the chief market in Saskatchewan; Calgary and Edmonton are the leading centers in Alberta; Vancouver, British Columbia, is the fourth commercial center of Canada, and carries on an extensive trade with the Orient.

### NEWFOUNDLAND

Politically Newfoundland is not a part of the Dominion of Canada, but is governed as a distinct British Colony. Fishing constitutes the principal industry of the island. There are also many good farms, and agriculture is practised to a considerable extent. The fish are exported to the United States, the West Indian Islands and European countries. St. Johns, the capital, has a fine harbor and is wholly engaged in the fishing trade. There are no other towns of importance on the island.

### QUESTIONS

What portions of the United States have a climate similar to that of most of the Canadian provinces?

Why is agriculture the principal industry of Canada? In what products does Canada compete with the United States in the markets of the world?

What portions of Canada are now being rapidly developed? What has led to their development?

What has given Montreal and Toronto their importance as commercial centers?

What are Canada's imports from the United States? What does she export to this country?





CATHEDRAL, MEXICO CITY



## CHAPTER II.

### MEXICO AND CENTRAL AMERICA.

#### MEXICO.

##### **POSITION AND EXTENT**

The Republic of Mexico extends from the thirty-second to the fifteenth degree of north latitude. In area it is some larger than that part of the United States east of the Mississippi River. It is a long and narrow mountainous plateau, rising abruptly from each coast to a height of from 4000 to 8000 feet, and formed by a continuation of the Rocky Mountains, which are here known as the Cordilleras. Some of the volcanic peaks have an altitude of nearly 20,000 feet.

##### **Climate**

The location of Mexico would indicate a tropical climate, but this is greatly modified by the altitude. The inhabitants recognize three climatic zones; the hot zone, which they call Tierra Calienta, extending from sea level to an altitude of 3000 feet; the temperate zone, Tierra Templada, extending from 3000 to 5000 feet; and the cold zone, Tierra Fria, having an altitude of from 5000 to 7000 feet and over. There are two seasons, the wet, extending from May to October, and the dry, during the remainder of the year. During the wet season, rain falls daily, but good drainage gives the temperate belt very healthful climate. The interior plateau and the northern portion of the western coast have but little rain.

##### **Resources**

The agricultural products of the three zones are characteristic of their respective climates. Along the coast and in the lower altitudes coffee, rubber, sugar-cane and tropical fruits are the staple products; in the temperate belt, cereals, especially corn, and fruits of the temperate climates are

cultivated. Corn is the most important crop, but Mexico has lost her former position among the corn-producing countries of the world. She was formerly fourth, but now she is surpassed by most of the countries of South America and Europe. Cacao is grown, and tobacco is an important crop, because of its excellent quality. Some cotton is raised, but not enough to supply the needs of the local mills. The forest products include cedar, oak, walnut, ebony, rosewood and mahogany. Sisal hemp, or henequin, is grown extensively in Yucatan, and is exported in large quantities. The northern part of the country and the high plateaus are well adapted to grazing, and quite a number of cattle and sheep are raised in these regions.

The mineral resources are of the greatest importance. Mexico is the leading silver-producing country, her output being about one-third the world's supply. Considerable gold, mercury, iron, copper, lead, and tin are also obtained. In most places the crudest methods of mining prevail, but capitalists from the United States have become interested in some of the leading mines and introduced modern methods. Building stone of excellent quality is abundant, and the Mexican onyx is highly prized for finishing interiors.

Coal and asphalt have been found, and large oil fields yield a bountiful supply of petroleum. The wells are controlled by British and American capital.

### **Inhabitants**

The inhabitants are Spaniards, Indians, and a mixed race, descendants from the intermarriage of the other two. The population numbers about 15,500,000. The Indians and Mexicans are engaged in agriculture and mining. There are but few manufactures, and these are either under the control of the Spaniards or Americans who have recently established them. Spanish is the prevailing language.

### **Commerce**

The United States, Germany, and Great Britain take most of the foreign trade. Our share is not as large as that of the European countries. We import rubber,



coffee, gold, and mining products, and export cotton goods, boots and shoes, machinery, hardware and tools, scientific apparatus, carriages and railway appliances. Our exports amount to about \$48,309,000 a year, and our imports about \$97,676,000.

**Transportation** All the important cities are connected by railway and telegraph, and two trunk lines connect the country with the United States. The Tehuantepec Railway is the most important trunk line and connects the Atlantic and Pacific Oceans. It is under the management of English capitalists, and until the completion of the Panama Canal it was of great importance in shortening the trade route between the Atlantic and Pacific ports. There is a good coastwise trade on the Gulf. The leading ports are Tampico and Vera Cruz. Mazatlan, Acapulco, San Blas, and Manzanillo are the important ports on the Pacific coast. Acapulco has an excellent harbor, but on account of lack of railway connection its trade is quite small. Mexico, the capital, is situated in the interior on a plateau 7000 feet in altitude, and is a modern American city.

*Note.*—The facts stated in this chapter apply to Mexico previous to 1911. From the overthrow of Madero in that year to the accession of Obregon to the presidency, Dec. 1, 1920, the country was the scene of one revolution after another, and all industries were practically suspended. During Carranza's administration there was some attempt to restore the country to its former degree of prosperity, but it met with little success. Under President Obregon's wise rule the country is gradually regaining its normal condition.

## QUESTIONS

How do you account for the great variety of products that can be produced in Mexico?

Why are the industries and resources of the country so poorly developed?

What railway connection does Mexico have with the United States?

With what countries does Mexico carry on most of her foreign commerce?





## CENTRAL AMERICA

This is a narrow mountainous stretch of country reaching from Mexico to Panama. It comprises five small individual states: Guatemala, San Salvador, Honduras, Nicaragua, Costa Rica, and the British Colony of Balize, sometimes called British Honduras. The entire area is about equal to that of the New England and Middle States.

The country is low and unhealthful on the Caribbean Coast, but more elevated along the Pacific Coast. The elevated regions are comparatively healthful, and most of the people live among the highlands. The climate and products are wholly tropical. The inhabitants are Spaniards, native Indians, negroes and the descendants from these races. Most of the interior is unsettled.

Owing chiefly to the extension of railway lines, the commerce of these states has improved since 1910. Central America now has over 1750 miles of railways, distributed as follows: Guatemala, 613 miles; Honduras, 240 miles; Nicaragua, 200 miles; Salvador, 264 miles. Costa Rica, 438 miles. In addition to this mileage Panama, which is not considered a Central American state, has 248 miles. Coffee, hides, mahogany and tropical fruits are the chief exports. About one-half the fruit trade is with the United States. We send them cotton goods, tools, hardware, flour, and wine. The entire trade with the United States amounts to about \$78,338,000 a year, of which \$44,752,000 consists in exports and the balance in imports.

There is great wealth in these little domains, consisting chiefly of agricultural products.



THE UNITED FRUIT COMPANY'S WIRELESS STATION AT PORT LIMON, COSTA RICA.



**SALVADOR** The coffee industry is first among the business interests of Salvador. In this country alone there are 166,039 acres in coffee, and the annual production is around 75,000,000 pounds. Some efforts have been made to encourage the production of cotton, but with indifferent success. The trade of Salvador has been mostly with the United States, Germany, and France. There are many foreign investments in this country, mainly in timber, minerals, and railroads.

**HONDURAS** This is distinctly a cattle country, though this industry has never been developed to anything like the degree to which it may be. It is also wealthy in minerals. There are rich deposits of gold, platinum, silver, and copper, and a large sum of foreign money is invested in these mines. Of course, the bulk of the export trade is in fruit — bananas, cocoanuts, and so on. Social conditions in Honduras are well advanced. The systems of education and health are good. There are few children in Honduras of school age who have not had educational advantages.

**COSTA RICA** Fruit and coffee constitute the bulk of the trade of Costa Rica. The United Fruit Company, formerly under the British flag, but in recent years transferred to the United States flag, has proved a great power in the development of Costa Rica. The company has from 40 to 60 vessels in constant operation in the Carribbean Sea and the Gulf of Mexico, and by means of its wireless facilities keeps in touch with the whole fleet. There are railroads between the larger cities which pretty well traverse the entire country, one of them, 385 miles in length, connecting the Atlantic and Pacific sea-coasts of Costa Rica.



SOUTH AMERICA, SHOWING THE PRINCIPAL STEAMSHIP LINES CONNECTING THE CONTINENT WITH NORTH AMERICAN PORTS



## CHAPTER III.

### SOUTH AMERICA

#### POSITION AND SURFACE

With the exception of a few extreme points South America extends from the tenth parallel of north latitude to the fiftieth parallel of south latitude. Nearly all of the continent is in the Torrid or South Temperate Zones and its latitude would give it a tropical or a semi-tropical climate, but in the western part this is greatly modified by the mountains.

In its general plan the surface of South America resembles that of North America, the great Andean Mountain system extending the entire length of the continent on the western side. The average height of these mountains is greater than that of the Rocky Mountains, the ranges are nearer together, and the intervening plateaus are narrow. The Andes are nearer to the coast than even the Coast Ranges in North America, and their western descent is very steep, consequently the rivers flowing into the Pacific are few, small, and rapid, and are of little or no aid to commerce. The eastern slope is long and more gradual, merging into the great plains that extend to the Atlantic Coast.

The eastern highlands are divided into two groups, the Guiana Highlands, between the Amazon and the Orinoco, and the Brazilian Highlands, south of the Amazon. Both groups consist of old mountains that have been worn down, so that their rounded summits resemble those of the Appalachians.

The Guiana Highland is loftiest in the west, where the highest summits have an altitude of 8000 feet or more. These descend by terraced slopes, forming on the north one side of the Orinoco

basin, while the other side is formed by the southern and eastern slope of the Andes.

The Brazilian Highland reaches its greatest altitude near the tropic, where it is 8500 feet, with an average of from 4000 to 5000 feet. The region is characterized by a large number of ranges of high hills and low mountains that have been worn down, the material thus removed forming the plateau at their base.

The great Basin of the Amazon lies between the Guiana Highland on the north and the Brazilian Highland on the south, and extends westward to the base of the Andes. The southern boundary is irregular, being formed by the divide which separates the tributaries flowing into the Parana and the La Plata. The tributaries of the Amazon from the south are all large, and nearly all have falls at about the middle of their course, which obstruct navigation.

The basin of the La Plata is long and narrow, and consists of the lowlands formed by the flood plains about the mouth of the river, and the highlands surrounding this region of lowland and extending westward to the Andes. The Amazon and La Plata, with their tributaries, form extensive systems of waterways that are of the greatest value to the region through which they flow.

**Climate** Most of South America has a tropical climate, with two seasons, the rainy and the dry. The great altitude gives those portions of the plateau between their northern extremity and the vicinity of the Tropic of Capricorn, a temperate climate; while some of the highest peaks are capped with snow. Most of this portion of the plateau is also arid.

The Guiana Highland and the Orinoco basin have a warm temperate climate, and the highest temperature is reached during the northern summer, when the heat is so intense that the people forsake the lowlands for the mountains. An abundance of rain falls during the rainy season.

The basin of the Amazon is characterized by intense heat and



heavy rainfall. These conditions account for the dense forests of the Amazon valley and other luxuriant vegetation of the region.

The basin of the La Plata has a tropical and sub-tropical climate, with plenty of rain, until the extreme southern portion is reached. Here arid conditions are found, but there is sufficient moisture to afford excellent grazing regions. The southern portion of the continent has a temperate climate.

**The People** Brazil was settled by the Portuguese, but all of the other South American States are of Spanish origin. Portuguese is the language of Brazil, and Spanish that of the other countries. Aside from these two nationalities there are but few white people on the continent. These are mostly Germans and Englishmen. Indians make up a large part of the population. There is also a third class, which comprises the descendants of the native races mixed with the Spaniards. In the tropical regions the people lack ambition and enterprise, but the inhabitants of Chile and Argentina are energetic and progressive.

**Government** With the exception of the Guianas, which are, respectively, British, French, and Dutch colonies, all of the South American States have a republican form of government, patterned quite closely after that of the United States. For a long time after these countries gained their independence they were disturbed by political strife and frequent revolutions which prevented the development of their resources or the establishment of important industries. These conditions have now passed and the South American states are making good progress. The World War gave the United States opportunity to increase her trade with these countries and between 1916 and 1920, this trade increased nearly 100 per cent. Great Britain, Germany, and France are the other leading countries engaged in this trade. From an industrial point of view these countries can best be divided into two groups: the Andean countries and the countries of the lowlands.

## THE ANDEAN COUNTRIES.



THE HARBOR, PANAMA

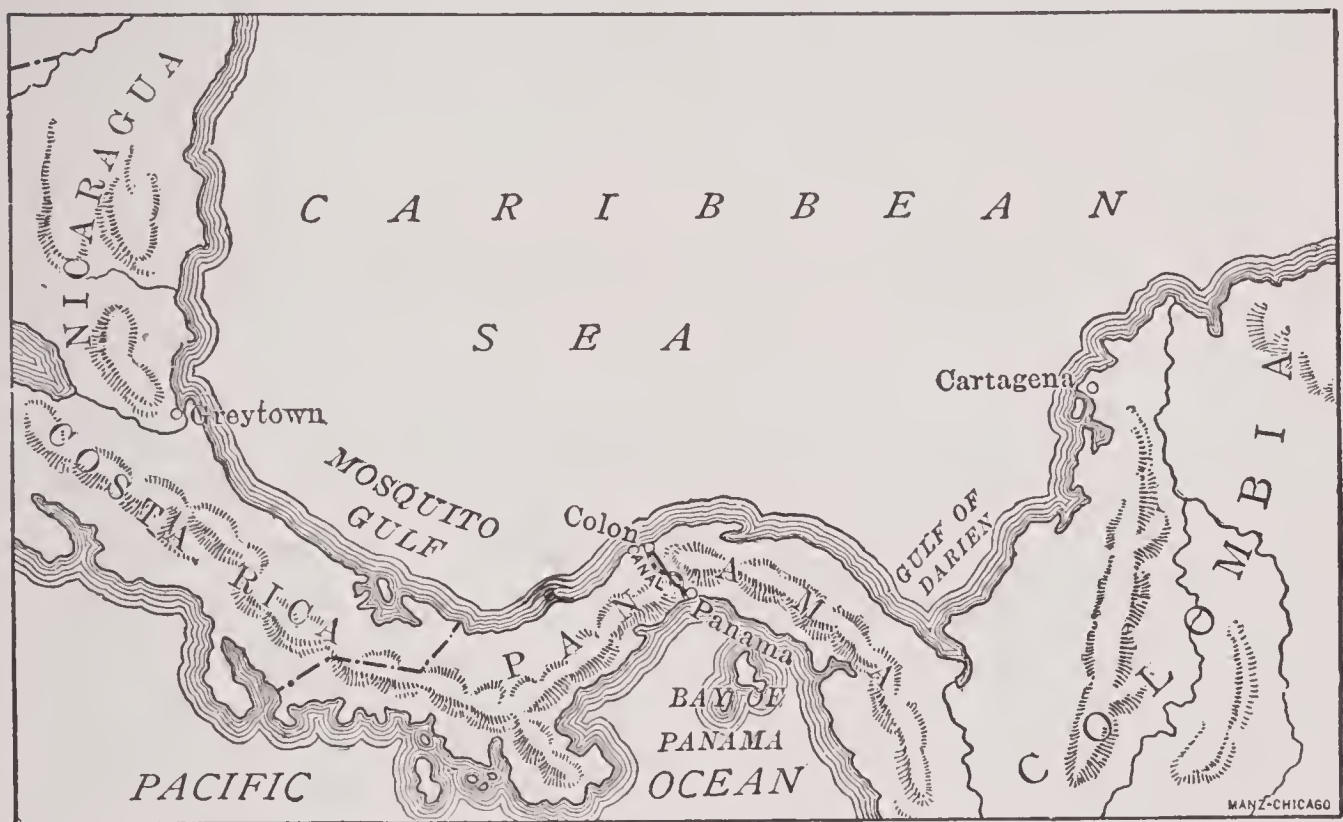
### PANAMA

Panama is the most northerly country of South America, and one of the most recently formed republics of the world. It is a long, narrow strip of land, co-extensive with the Isthmus of Panama. Its length is about 460 miles, and its width varies from 31 to 70 miles. In area it is about equal to the State of Maine. The surface is high and rocky on the Pacific coast, and low and marshy on the Carribbean coast. The climate is tropical, damp, and unhealthful to all save the native people. The population is composed chiefly of mixed races which have descended from Spanish, Indian, and negro origin, and there are but few white people in the country. There are no manufactures, and the commerce, as far as the country itself is concerned, is of no importance. Panama, the capital, is the Pacific terminus of the Panama Railway, and has a population of about 25,000. It is the financial and commercial center of the country. The only other town worthy of mention is Colon at the



Caribbean terminus of the railway. This has a population of about 3000, and at present is of considerable importance on account of its relation to the Panama Canal.

The Panama Canal, from deep water in one ocean to deep water in the other, is about 50 miles long, but the canal proper, from the beginning of excavations on one coast to the end on the other, is approximately  $41\frac{1}{2}$  miles long. Its highest point, 85 feet above sea level, is reached by a flight of three locks at Gatun on the Atlantic



PANAMA AND THE PANAMA CANAL

side, and by one lock at Pedro Miguel, and a flight of two locks at Miraflores on the Pacific side. Each lock is 1000 feet long and 110 feet wide. The canal varies in width at the surface from 300 to 1000 feet, according to sections. The minimum depth is 41 feet. The first vessel passed through on August 14, 1915. The completion of the canal has changed a number of important sea routes and shortened the sailing distance from New York to San Francisco over 7800 miles. In 1921, 2892 vessels passed through the canal.



SCENE IN CARTAGENA

## COLOMBIA

The United States of Colombia occupies the extreme north-western portion of the continent. It has an area of a little over 480,000 square miles, and the population is about three and one-third millions. On account of the various altitudes, a country like Colombia has three climate zones; the tropical region of the lower altitudes, the temperate of the medium, and the cool of the high altitudes. The east coast is low and unhealthful. It is valuable for grazing purposes, and large numbers of cattle and sheep are raised. The plains and the mountains produce wheat, domestic animals, and some other agricultural products common to temperate regions. The tropical products are coffee, cacao, tobacco, vegetable ivory, copaiba, tolu, and rubber, all of which are gathered by the Indians. The mountains contain large deposits of gold and silver, and valuable salt mines are worked near Bogota. These are a government monopoly, and considerable revenue is derived from them.

Transportation facilities are very poor. There are a few short lines of railway extending from the coast towns inland, but the



# - PRODUCTS -

Animals  
Bananas  
Coffee  
Gold  
Hats (Panama)  
Hides  
Ivory Nuts  
Platinum  
Rubber  
Tobacco  
Wood and Lumber



# - PRODUCTS -

Cocoa beans  
Coffee  
Fresh fruits  
Gold Bullion and dust  
Gold ore and bars  
Hats (Panama straw)  
Hides  
Ivory nuts  
Rubber



interior is entirely lacking in carriage roads, and goods are transported by pack trains. The Magdalena and its tributaries are navigable for 600 miles to La Dorado, and steamers can ascend the Orinoco as far as Cabugaro, which is within about 200 miles of Bogota. Bogota is the capital, and Medellin is another important city, but they are so situated that commercial relations between them are practically impossible. Barranquilla and Sabanilla, at the



ALONG THE WATER FRONT NEAR THE MARKET, CARTAGENA

mouth of the Magdalena, and Cartagena are the chief ports through which most of the foreign trade is carried on. This is of but little importance. The country exports hides, tallow, tobacco, and copaiba, and tolu to the United States; and gold and silver ore to Great Britain. The imports consist of textiles and other manufactures, most of which are obtained from Great Britain, while from the United States the country receives its supply of oils and petroleum.





CENTRAL AMERICA

CARIBBEAN SEA

Venezuela

WEST INDIA IS.

TOBAGO ISL.

TRINIDAD

Port of Spain

Barbados

St. Vincent

L. Nicaragua

Santa Marta

Barranquilla

Cartagena

Maracaibo

Valencia

La Guayana

Barceloneta

San Juan

San Pedro de Macoris

Colon

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Panama

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Bay of Panama

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Buenaventura

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Esmeralda

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Manizales

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Quito

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Guayaquil

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Payta

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Piura

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Trujillo

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Santa

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Huanuco

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Callao

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Lima

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Jauja

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Huancavelica

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Pisco

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Ica

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Chumbivilcas

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Acari

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Arequipa

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Tacna

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Pisagua

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Iquique

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Cristobal

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Calama

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Cobija

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Salinas

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Antofagasta

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Ballenita

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Obispo

San Jose

Merida

San Felipe

San Vicente

San Barbara

San Pedro de Macoris

San Juan

San Pedro de Macoris

San Juan

Port Copiapo

San Jose

Merida

San Felipe

San Vicente

San Barbara





## ECUADOR

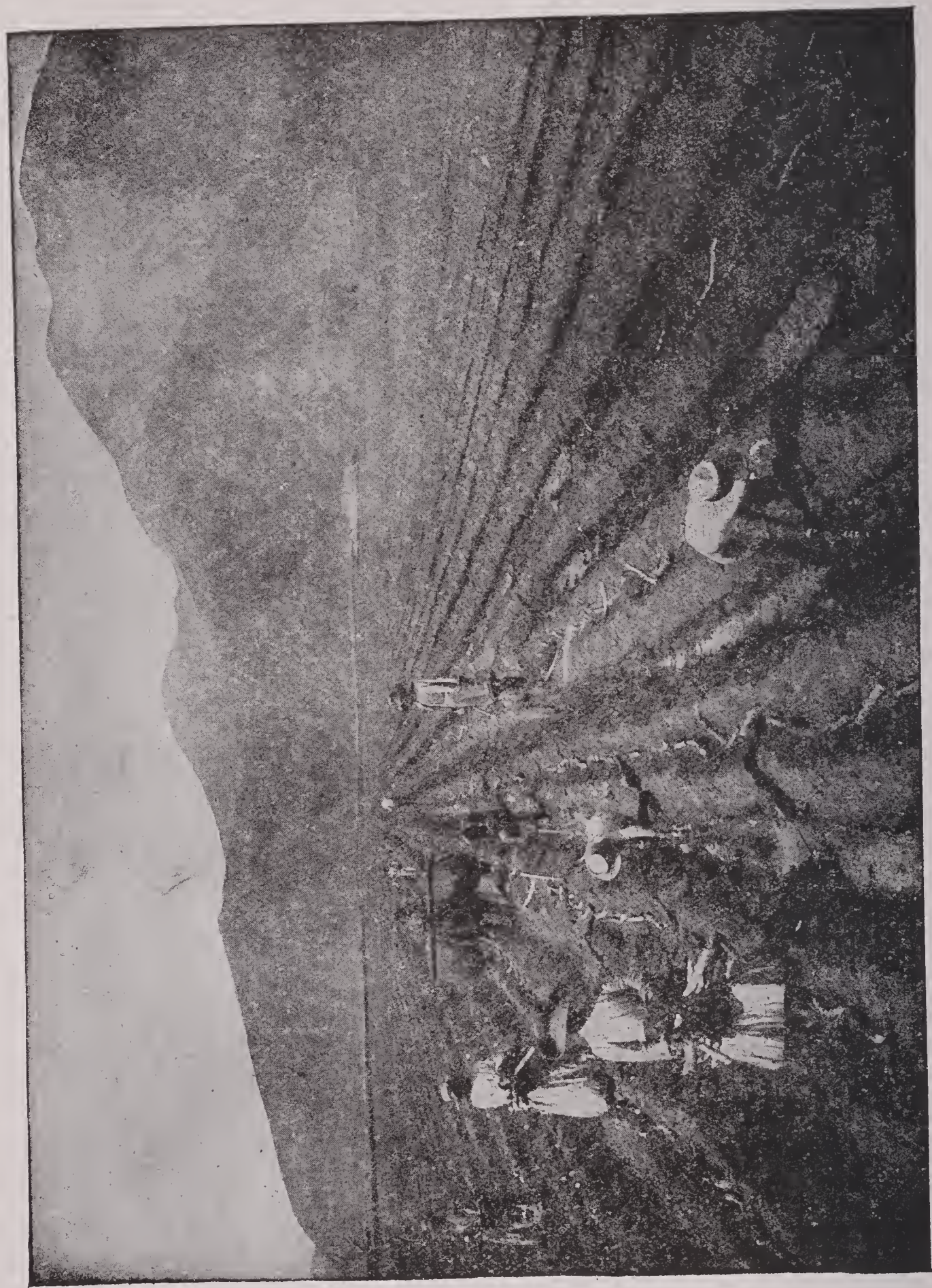
Ecuador is a little smaller than New Mexico and has a population of about 2,000,000, most of whom are Indians. The exports are cacao, coffee, sugar, Peruvian bark, ivory, nuts, and rubber. Cacao constitutes about three-fourths of the exports. The land is held in large estates and the laboring people are in a condition bordering on slavery. The most important article of manufacture is Panama hats. These are made from torquilla straw, which is the midrib of the leaf of the screw pine. The work is done almost wholly by Indians, and because dampness is essential to success most of the hats are made at night.

The imports are food stuffs and manufactured textiles. The country has extensive mineral deposits, which, undoubtedly, are rich, but they have not yet been developed. The copper, gold and silver mines are worked to a limited extent. Transportation is exceedingly poor. Most of the goods are carried on pack animals. A carriage road extends from Quito, the capital, to Guayaquil, the leading seaport, a distance of 115 miles. Most of the foreign trade is with France and Great Britain. That with the United States amounts to about \$5,000,000 a year.

## PERU

Peru is situated south of Ecuador, and lies almost wholly among the mountains, with a long desert sea-coast on the Pacific. Peru has an area of 722,461 square miles and a population estimated at about 4,500,000, more than one-half of whom are native Indians. Most of the country has a high altitude and a cool temperate climate. In the northern part, the eastern slope of the mountains is heavily timbered. As a whole, the country has but little rainfall. The





PLANTING SUGAR CANE, SANTO CLARO, PERU. (Showing Irrigation)



leading agricultural products are cotton, sugar, coffee, cacao, and tobacco. The other products are cinchona, from which quinine is made; cacao and other medicinal plants, dye stuffs and rubber. The country has considerable good grazing land and many sheep. Llama and cattle are raised; from these wool, alpaca, and hides are exported.

Peru is rich in minerals, and mining is the leading industry. Gold, silver, copper, lead, zinc, and mercury compose the metals, and coal, salt, borax, sulphur, and petroleum the non-metals which are exported. The manufactures are straw hats, woolen fabrics, sugar, candles, soap, shoes, and a few other small articles. All manufacturing is on a small scale and in a crude state. Its purpose is to supply the local demand only. The country lacks capital, and means of transportation are still poor. There are about 1000 miles of railway in operation. The Amazon and its tributaries afford good water routes for the eastern portion of the country, and this is of great advantage, as most of the trade is on the eastern side of the mountains. Lima, the capital, and Callao, the principal seaport, are connected by railway. Most of the foreign trade is with Great Britain and France, the United States having only a small portion. The country also has considerable trade with the surrounding South American States.

## BOLIVIA

Bolivia, has an area of about 514,000 square miles, being nearly equal to Colorado, Arizona, New Mexico, and Texas combined. The population is only two and a half million. Bolivia is wholly an inland country, and its only outlet to the sea is through one of the surrounding states. The country is rich in resources, but in a very backward condition. Agriculture is the most important industry, and the chief crops are coffee, rubber, and sugar. Cereals and vegetables are grown on the tablelands, and cattle, sheep, and llamas





**BOLIVIAN ORE CARRIER**

(Photograph by William V. Alford)



are raised in large numbers. The lowlands and plains are fertile, and many of them contain dense forests, from which chinchona bark and other valuable medicinal products and dye stuffs are obtained.

Transportation is exceedingly poor. The plains afford good location for highways leading down the eastern slope. Three railways leading to the sea in Chile have been completed. A rail-



#### MINING TIN ORE IN BOLIVIA

(Photo by George W. Deane. Illustration used by courtesy of Pan American Union)

Stone quimbalates were formerly used by the natives in Bolivia for hand crushing or grinding tin ore. In nearly all the tin mines of the country the antiquated stone crusher has been supplanted by modern power mills.

way connects the country with the railway in Argentina, and La Paz, the chief city, is also connected with the seaport of Antofagasta in Chile. Sucre is the capital and city next in importance. Most of the trade is with the surrounding states. The exports are coffee, rubber, cacao, copper, silver, and tin, and the imports are manufactured clothing, textiles, food stuffs, hardware, and spirituous liquors.





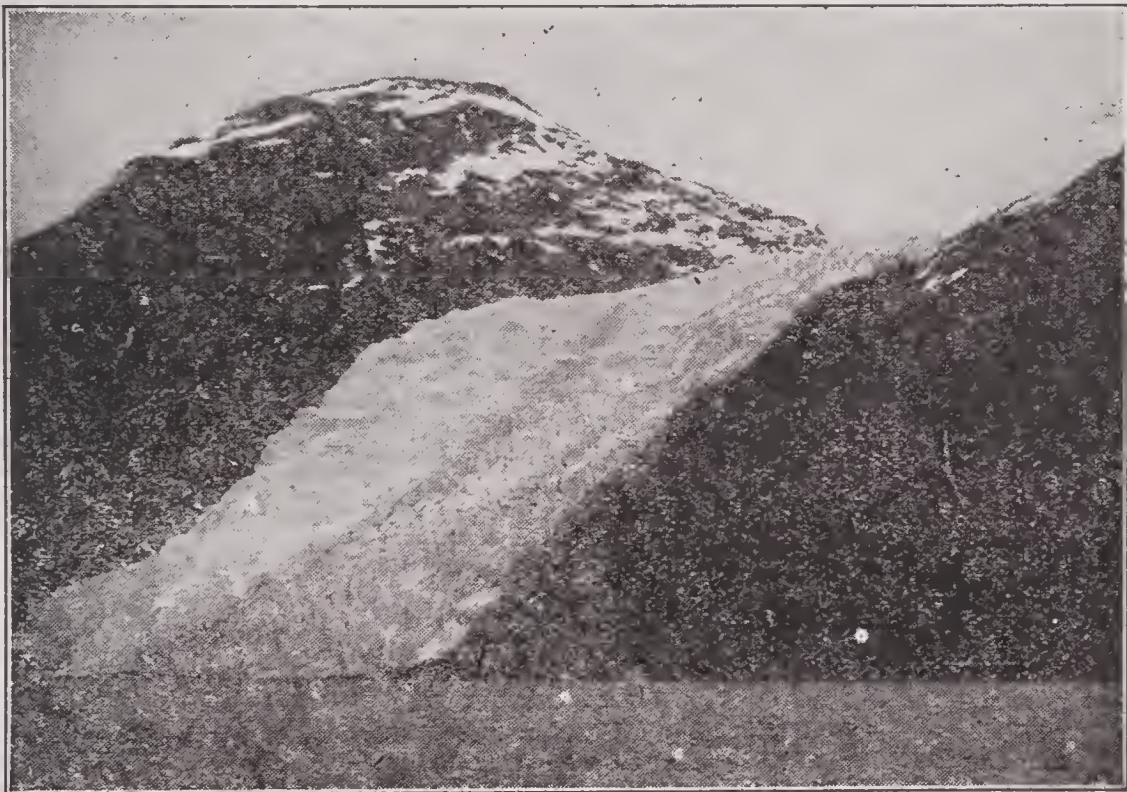
SHEEP IN PUNTA ARENAS

## CHILE

Chile is the most important mountain state. It is long and narrow and has a coast line of over 2500 miles, extending southward from the Tropic of Capricorn. Its area is 290,000 square miles and it has a population of 3,642,000. Though having but a small proportion of fertile land this is so well cultivated that the country produces abundant crops of wheat, barley, and various other food stuffs of the temperate regions, and fruits are grown in sufficient quantities to supply the home market and also to furnish exports for the neighboring states of Bolivia, Peru, and Ecuador. A great deal of the cultivated land is under irrigation. The uplands furnish excellent grazing and large numbers of sheep and cattle are raised. These furnish merino wool and hides and leather for export.



The mineral resources are by far the most important. Although the northern part of the country is a desert, it contains extensive deposits of nitrate, or Chile saltpetre, which occurs in the form of a soft crystalline rock that is mined and exported to Europe and the United States, where it is ground and used as a fertilizer, and in the manufacture of certain chemical products. The next most valuable mineral product is copper, nearly all of which is exported to Great Britain. Coal is mined in the southern part of the country,



A GLACIER, PUNTA ARENAS

but since it is not of suitable quality for smelting purposes, considerable is imported from Australia.

The country is well supplied with railways, most of which are built and operated by the government. Santiago is the capital and Valparaiso is the chief seaport, and also the business and financial center of the Pacific coast of South America. Previous to the outbreak of the European war in 1914, most of the forwarding trade was in the hands of British and German merchants, but since that

date the trade with the United States has more than doubled. The transcontinental line of railway connecting Valparaiso with Buenos Aires saves shipping goods around Cape Horn. The other important towns are Concepcion, Talca, Chillan, Iquique, and Copiapo.



FRIEG INDIANS, PUNTA ARENAS

Punta Arenas, on the Strait of Magellan, is the southernmost town in America.

The foreign trade is controlled by Great Britain, which has about two-thirds of it; Germany and France have most of the remainder. The United States supplies the country with a portion of its textiles, and also with lumber from Oregon and Washington, and with petroleum. Our imports are principally nitrate.



## THE LOWLAND COUNTRIES

### VENEZUELA

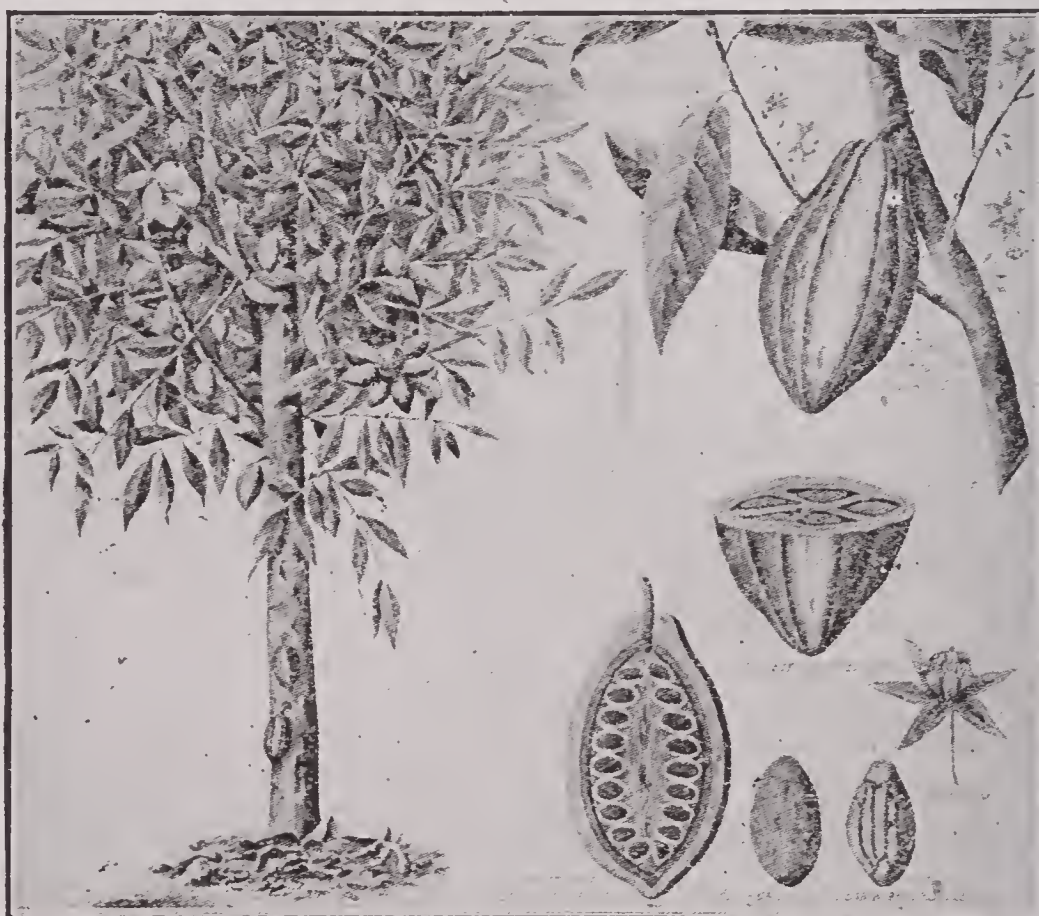
Venezuela is the most northerly country bordering on the Atlantic. The area is 398,594 square miles. The most reliable estimates of the population placed the number of inhabitants in 1915 at about 2,250,000. One-seventh of these are Indians. The country has a tropical climate, and is unhealthful except in the mountainous regions. The lowlands have a tropical vegetation, but the higher altitudes produce the plants of the temperate zone. The leading industries are agriculture, grazing, and the gathering of forest products. Coffee is the most important crop, and about 200,000 acres are devoted to its cultivation. Cacao and sugar are grown in the lowlands, and cereals in the mountainous districts. The llanos are great plains covered with grass, which furnish pasturage for herds of cattle, sheep, horses, goats, and swine. The mineral resources are important, and consist of gold, silver, copper, iron, sulphur, petroleum, asphalt, coal, salt, and kaolin, from which porcelain is made.

Asphalt is a mineral pitch, or solid form of bitumen, and is derived from sources similar to those from which coal and petroleum have been formed. The lake on Trinidad is from eighteen to seventy-eight feet in depth, and is estimated to contain 6,000,000 tons.

A large lake of asphalt on the Island of Trinidad is under the management of American companies. Numerous large pools of

this mineral are also found along the neighboring coast. It is extensively exported, and used in asphalt pavements.

The country is poorly equipped with roads, and there are about 550 miles of railway consisting of certain short lines that extend from the agricultural districts to ports on the Caribbean. Nearly all goods are transported by pack animals, except in the region of the Orinoco, which furnishes a good waterway for that portion of



THE CACAO TREE, PODS ON THE TREE AND IN SECTIONS, AND THE BLOSSOM

the interior through which it flows. Caracas, the capital, and Valentia, on the Caribbean, are the most important cities and are situated in the midst of a fertile and productive agricultural district. Maracaibo, Puerto, and Cabello are the principal seaports. The country lacks capital, and frequent uprisings and revolutions have nearly ruined its industries.



The foreign trade is with the United States, Great Britain, France, Germany, and Spain. We furnish the Venezuelans with one-half of their imports, consisting of cotton fabrics, ironware, flour, and canned goods; and receive from them coffee, hides, rubber, and asphalt.

## GUIANA

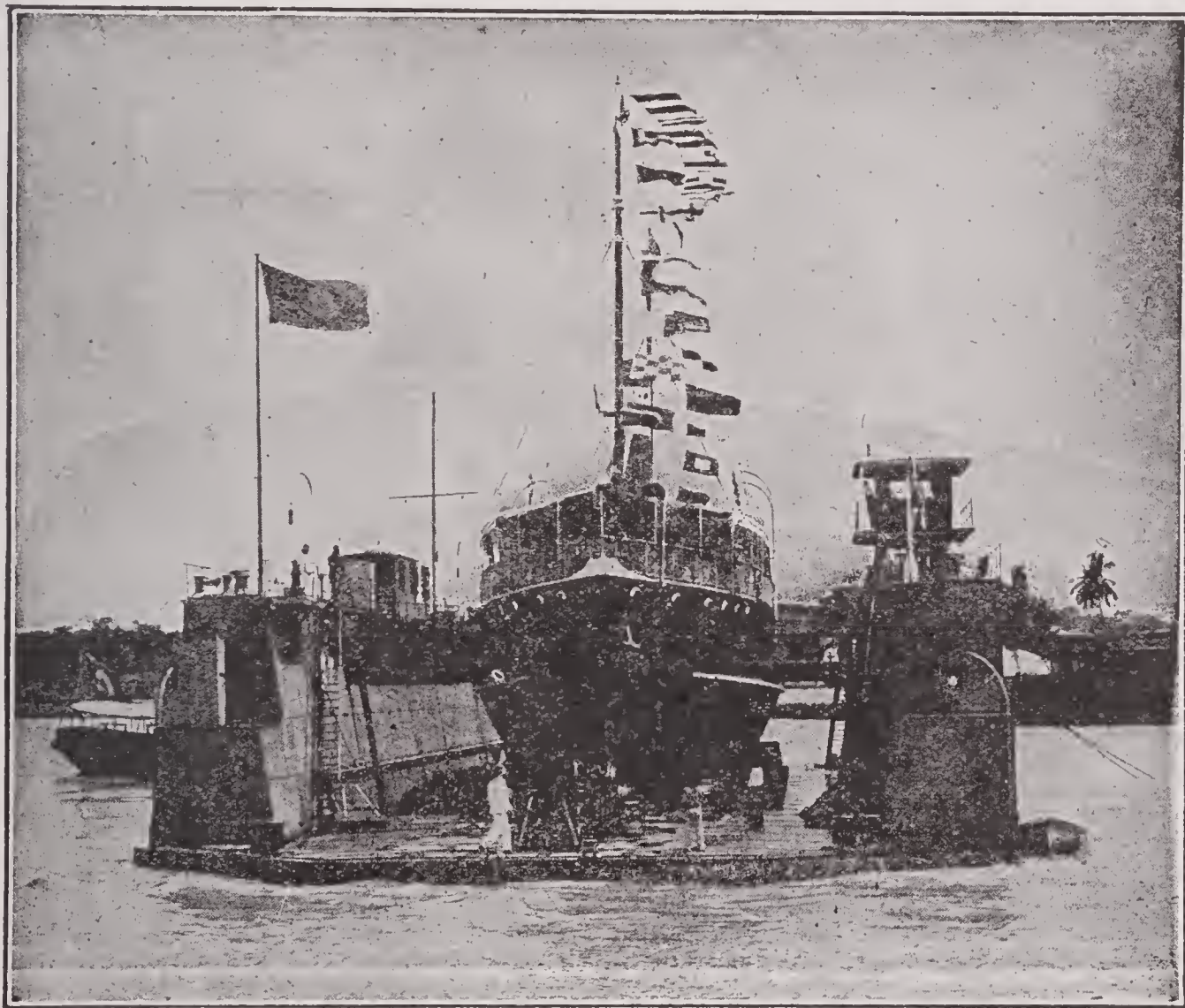
Guiana is divided into three colonies known respectively as British, French, and Dutch Guiana; these constitute the only colonial possessions in South America. In area the country is about equal to California and Maine. Fully one-half of the territory belongs to Great Britain, and the remainder is about equally divided between France and Holland. The climate is tropical, and unhealthful along the coast. Only small tracts of land are under cultivation, and these consist of narrow strips along the coast region, which are protected by dykes. Sugar-cane is the chief agricultural product, but the manufacture of beet sugar in the northern countries has greatly crippled the sugar industry in this part of the world. The country is rich in gold and diamonds, but the mines have not been extensively worked. Georgetown in British Guiana, Cayenne in French Guiana, and Parimaribo in Dutch Guiana are the capitals of the colonies and the principal towns. The leading exports are sugar, cacao, coffee, molasses, and rum; and the imports are manufactured articles and food products. The principal trade is that with the mother countries, the United States having a small portion of it. Compared with the commerce of other countries that of Guiana is unimportant. A valuable diamond field has been discovered in British Guiana.



SUBURB OF BOTAFOGA, PART OF THE PICTURESQUE HARBOR OF RIO JANEIRO, SUGAR LOAF MOUNTAIN IN  
THE BACKGROUND



The Amazon Basin includes more than half the country, and supports the most dense and extensive tropical forests in the world. At present the great product of the forest is rubber, of which it supplies about one-sixth of the world's crop. This is gathered by the Indians, who live in a half civilized state, and whose crude



ONE OF THE FLOATING DOCKS AT VAL DE CAEN, PARA

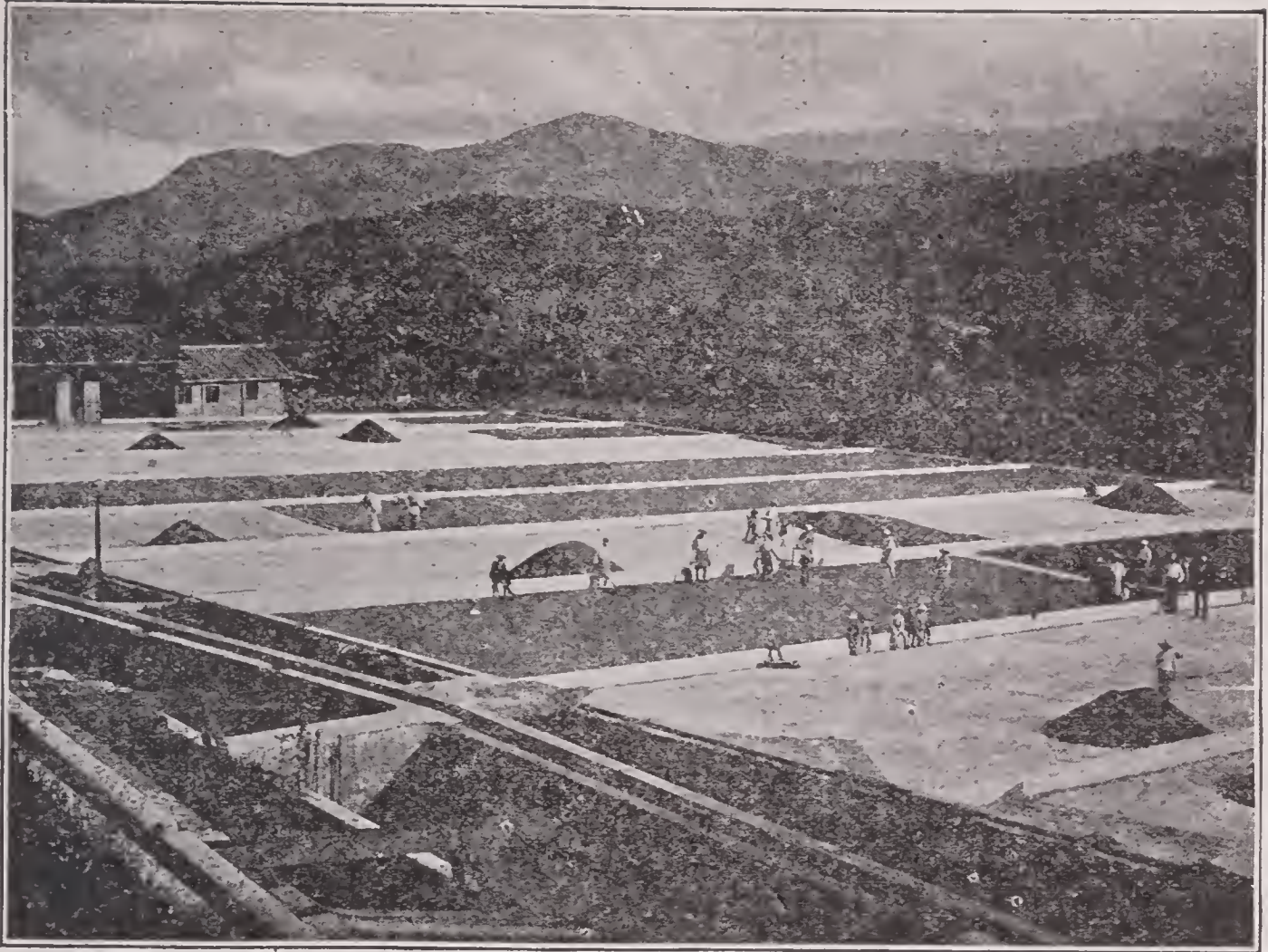
methods have greatly damaged many of the rubber trees. The Amazon crop also includes much of that gathered from the neighboring states. Most of it is shipped from Para, which is the greatest rubber port in the world. These forests also contain an inexhaustible supply of hard and soft woods suitable for all sorts



MAP OF BRAZIL SHOWING LOCATION OF THE PRINCIPAL PORTS.

(1) Porto Velho, 1800 miles up the Amazon and Madeira rivers; (2) Manaus, important rubber metropolis; (3) Para; (4) Recife; (5) Bahia; (6) Rio de Janeiro; (7) Santos; (8) Corumbá, 1800 miles from the sea at Montevideo.





DRYING COFFEE BERRIES

## BRAZIL

The Republic of Brazil is nearly as large as the United States, including Alaska, and occupies about one-half of the continent. It extends from the fifth parallel of north latitude to the thirty-third parallel of south latitude. The Equator crosses the northern part, and with the exception of the extreme southern portion, which is in the temperate zone, the country has a tropical climate. The population in 1915 was estimated at twenty-six and a half millions. It consists of Portuguese, negroes, native Indians, and mixed races that have descended from these, together with a few Europeans and Americans. The country is naturally divided into three productive districts: the Amazon Basin, the Middle Coast Region, and the Southern Coast Region. Most of the interior is still a vast wilderness.

of cabinet and building purposes, but the time for developing the lumbering industry is not yet ripe.

The leading products of the middle coast region are cotton and sugar-cane, and of the southern coast region and interior, coffee. Rice, black beans, and manioc are the most important food



products; yams, sweet potatoes, tropical fruits, and maize are also grown. Brazil nuts grow wild, and are exported in large quantities. These nuts grow in large spherical pods, containing 24 each. The pods are broken open and the nuts separated before placing them on the market.



Coffee is the most important agricultural product, and Brazil produces more than four-fifths of the world's supply. It is the seed of an evergreen shrub, which, when growing freely, reaches a height of from 10 to 20 feet. Under cultivation, the tree is kept cut down

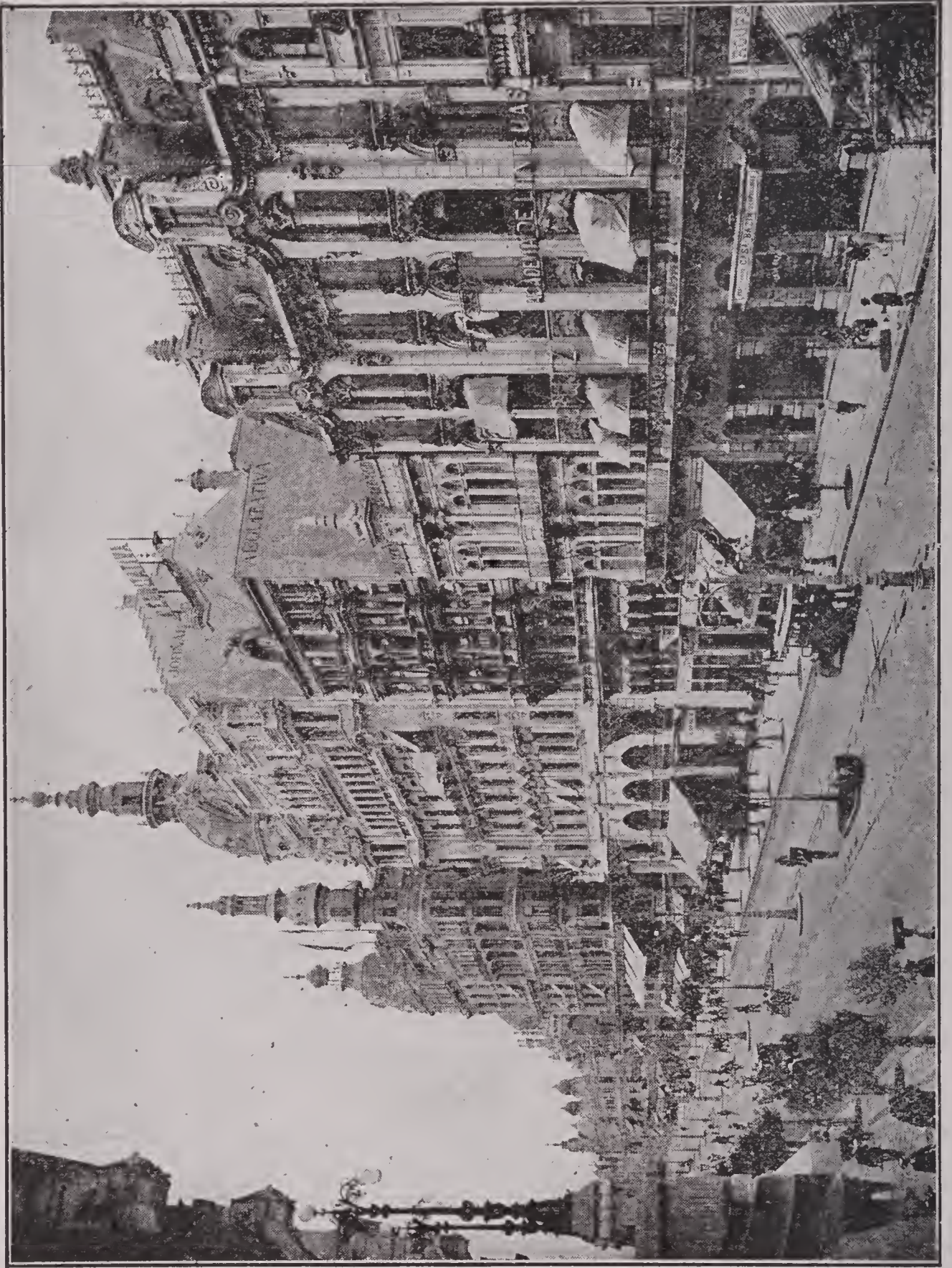


LOADING COFFEE AT SANTOS, BRAZIL

(Courtesy of Pan American Union)

to 7 or 8 feet, and the branches bend down nearly to the ground. The leaves are about 5 inches long, slender, and have a bright green, glossy surface. The flowers appear in the axils of the leaves, and are small and pure white. The fruit is a two-celled berry, of about the size and appearance of a cherry; when ripe, it is of a





AVENUE CENTRAL, RIO JANEIRO



dark red color. Each cell contains a seed which forms the coffee nib or bean. The orchards are kept well tilled and free from weeds. When the fruit is ripe, cloths are spread under the trees and they are shaken, which causes the berries to fall. The berries are dried on mats in the open air, then crushed between rollers to free the seeds from the husk. After a second drying in the sun, the seeds are winnowed, then packed in sacks ready for shipping. The average



AVENUES OF PALM TREES, AVENIDA DO MANGUE, RIO JANEIRO

yield is about a pound to a tree, but the best trees often yield three or four pounds.

The great mineral region extends along the Bolivian border to Matto Grosso, and eastward to the Rio Grande du Sul. Gold, silver, diamonds, and other precious stones, are found in this region. Before the discovery of the diamond mines in South Africa, those of Brazil were the richest in the world. Iron, copper, and coal are also found in paying quantities, but they have not been worked.



Manufactures are still in a primitive state, but foreign capital, principally from Germany, is invading the country and establishing new industries. The resources of Brazil are more extensive than those of any other South American country, and these establishments will, undoubtedly, continue to increase in size and number.



MUNICIPAL THEATRE OR OPERA HOUSE, RIO JANEIRO

The Amazon and Parana, with their tributaries, furnish a series of waterways leading to all ports of the interior. These rivers are of the greatest commercial importance, since without them it would be impossible to transport the rubber and other forest products to the coast. The roads are generally poor, but there are over 16,000 miles of railway in operation, consisting principally of short lines extending from the plateau to the nearest



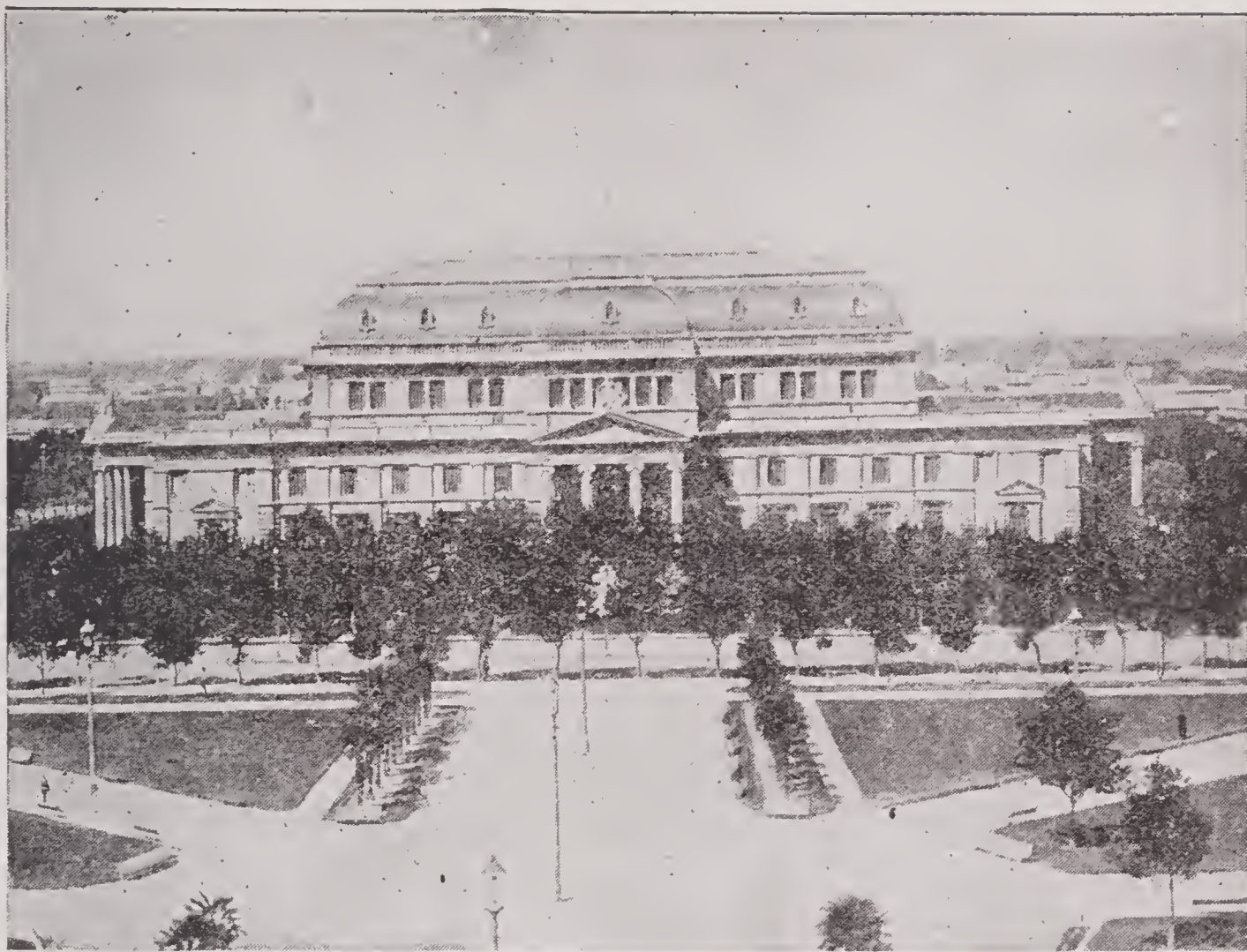
seaport. Most of the railways are owned by the government, and leased to private corporations. Rio Janeiro is the largest railway center.

The transportation facilities are still entirely inadequate to the demands made upon them, and with the extension of railway lines and the construction of good roads, the interior of the country could be profitably developed, and this would lead to great increase in production. Rio Janeiro is the capital and commercial center. It is the second largest city of the continent, having a population of about 962,000. It has an excellent harbor and steamer connections with the leading ports of the United States and Europe. Para, at the mouth of the Amazon, has an extensive trade in rubber. Pernambuco is an important sugar, coffee, and cotton market. Porte Allegre is the seaport for the German colonists, and Bahia has a large trade in cotton, sugar, and tobacco. Santos is the seaport of the State of Sao Paulo, and the largest coffee-exporting center in the world.

The annual foreign commerce amounts to about \$403,260,000, and it is divided between Great Britain, Germany, France, the United States, and a few other countries. The leading export is coffee, which is by far the most important product of the country, and the one from which the greatest amount of revenue is derived. The annual export is about 600,000,000 pounds and nearly the entire crop is taken by the United States. Rubber is second in importance, and in the production of this, Brazil formerly led the world. Other exports are hides, tallow, cotton, and Brazil nuts. Over one-half the foreign commerce is with the United States. The yearly exports to this country amount to about \$132,600,000, and our exports to Brazil amount to about \$41,200,000. They consist chiefly of flour, cotton goods, machinery, hardware, iron and steel goods, and petroleum. There are regular lines of steamers plying between the United States and the most important Brazilian ports.







GOVERNMENT HOUSE, LA PLATA, ARGENTINA

## ARGENTINA

Argentina, or the Argentine Republic, occupies the southern half of the eastern part of South America. It is about one-half the size of the United States, and has a population of about 7,980,000. A small section in the northern part has a tropical climate, but with this exception the entire country lies within the south temperate zone. The plains in the north have a tropical climate and vegetation; those of the central portions have a warm and temperate climate, while the plains of the south have a colder

climate. The mountainous region, which extends along the entire western part of the country, is cooler than other portions in the same latitude. The climate varies here with the altitude and the season of the year. Argentina is almost entirely one vast fertile plain, and is especially adapted to stock raising and growing cereals. It has become one of the largest wool producing countries of the world, and is now competing in the markets of Europe, with Russia and the United States, in the sale of wheat and dressed meat. The annual yield of wheat is now about 180,000,000 bushels, and over two-thirds of it is exported. Flax, corn, and sugar-cane are also successfully grown, as are various kinds of fruits suitable to the temperate and semi-tropical latitudes. Grape culture and the manufacture of wine are also becoming important industries.

The country is well supplied with minerals. Gold, silver, and copper ores are abundant in the mountain districts and gold is also found along the coast as far south as Tierra del Fuego. Coal, principally lignite, petroleum, sulphur, borax, nitrates, salt, and iron are found in sufficient quantities to be profitably mined. The foot hills and lower portions of the mountains are covered with extensive forests that yield timber and other valuable products.

Manufacturing is not extensive. What there is consists of the manufacture of flour and wine and in distilling and brewing. Nearly all of the manufactured products are imported. Argentina is better supplied with railways than the other South American countries, and the system is being continually extended. The completion of the transcontinental railway, from Buenos Aires to Valparaiso in Chile, was one of the most important commercial enterprises of the entire continent, and is found to be of great value to both countries. Buenos Aires, on the right bank of the La Plata, is the capital, and financial and commercial center. It is the largest and most important city of South America. In its buildings, its streets, and its public utilities it is a thoroughly modern city, and far in advance



of any other city of the continent. It has a large trade with European countries, and the United States. Other important cities are Rosario, Santa Fé, Parana, and Cordova, each of which has a good market for the surrounding farming regions.

The country has a growing and valuable foreign trade. The most important exports are: wool, hides, skins, corn, preserved meats, domestic animals, flax, tallow and fat, and wheat. Mutton is frozen and exported to Europe in refrigerator ships, while beef is jerked, or dried, and exported in this form. The imports are agricultural implements, textiles, boots and shoes, and clothing. The trade is carried on with Great Britain, France, Germany, Belgium, United States, and Italy. The exports to this country are confined almost entirely to cattle products and wool, while we send to them agricultural implements, iron and steel goods, oils, cotton goods, and wood and its manufactures. Our exports to Argentina amount to about \$68,000,000, and our trade with Argentina as well as that with other South American countries is rapidly increasing. For the purpose of stimulating this trade several of the large banks in the United States have established branches in Buénos Aires and other South American cities.

Argentina is the most progressive of the South American countries. It has ample resources, a fertile soil, and a temperate climate. Its inhabitants are energetic and progressive, and the government is stable and well disposed towards all lines of industry. During the last few years a large number of immigrants from Southern Europe have entered the country. With the addition of necessary capital to develop its resources, this Republic is in a fair way to become a strong rival of the United States in the markets of Europe.



PLAZA DE LA INDEPENDENCIA, MONTEVIDEO

## URUGUAY

Uruguay is a small country situated on the opposite side of the La Plata from Argentina. It has a large foreign population, and is in excellent financial condition. The principal industry is stock raising, and much attention has been given to improved breeding, by the introduction of European stock. The scientific methods pursued have made this little state one of the foremost cattle and sheep countries of the world. The value of the animal products exported is about \$70,000,000 a year. The soil is fertile; wheat and other cereals are raised, and some wheat is exported. Montevideo is the capital and most important city. The exports go to France and Argentina, and most of the imports are textiles and machinery, which are supplied by Great Britain and the United States.



## PARAGUAY

Paraguay is a small interior state to the north of Argentina. Most of its surface is covered with dense forests. The soil is fertile, and the climate is suitable for the growth of wheat and other cereals, but owing to the lack of transportation facilities, scarcely any of the resources have been developed. Sugar and maté, or Paraguay tea, are the only crops exported and these are of but little value. Asuncion is the capital and chief city.

## QUESTIONS

What effect do the Andes have upon the products and industries of South America?

What interests do the United States hold in Panama? What is the present condition of the Panama Canal?

Why do the Andean countries have so little commerce?

What conditions have made Chile the most prominent of these countries?

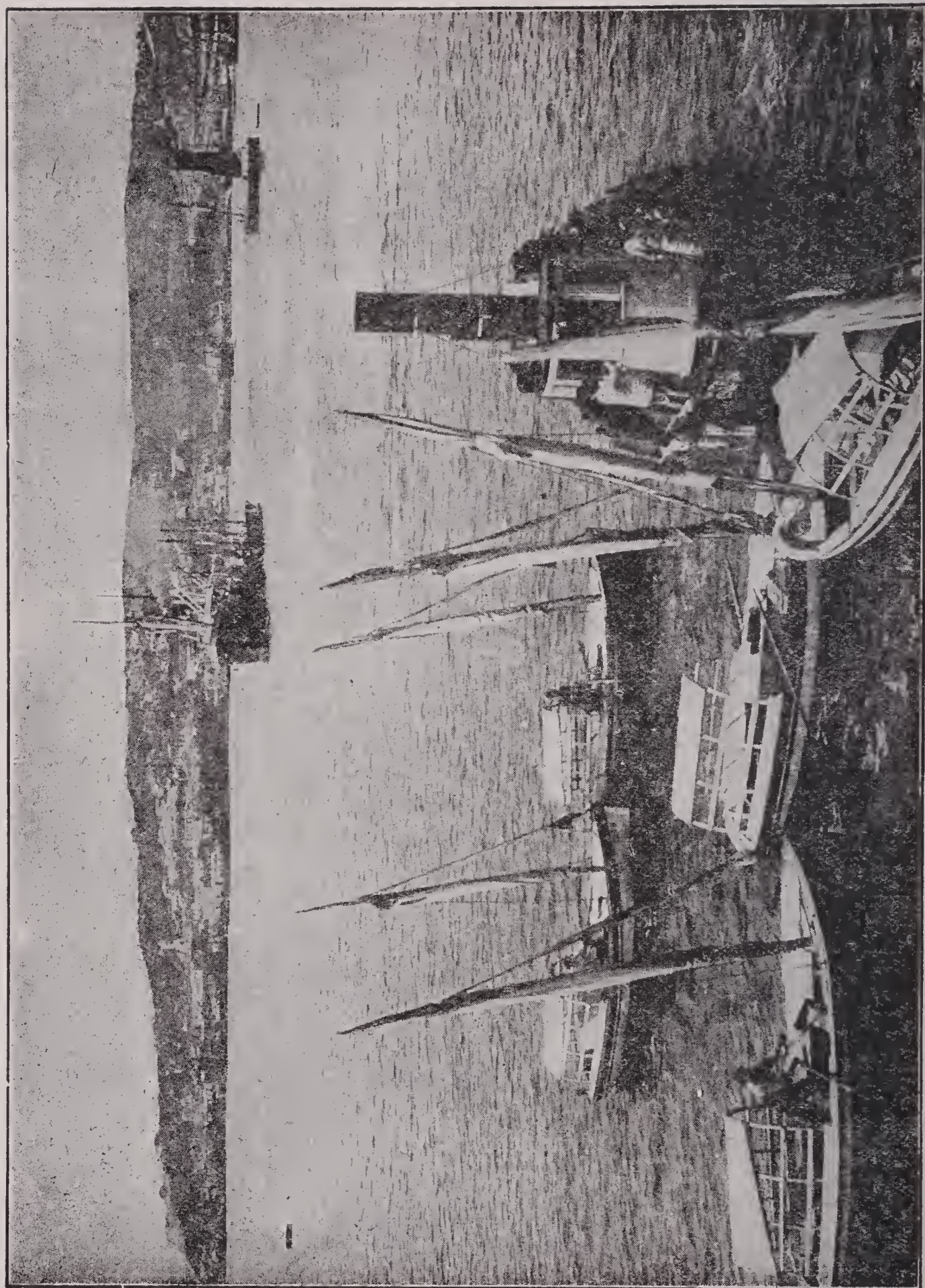
Which of the South American countries the most closely resembles the United States in climate and products? In what does this country compete with the United States in the markets of the world?

With what South American country do we have the largest trade? Why? Why do European countries have a larger trade than the United States with South America?

What has caused the United States to take so much interest in Venezuelan affairs?

How do you account for the lack of manufactures in South America?





THE HARBOR, HAVANA



## CHAPTER IV.

### THE WEST INDIES.

Cuba and Hayti have independent governments, the latter being divided into the states of Hayti and San Domingo, but all the other islands are colonies of Europe.

**CUBA** Cuba, the largest of the West Indies, has a length of 760 miles, and a breadth ranging from 25 to 130 miles. In area it is about equal to Pennsylvania, and has a population of about two and a half millions, nearly equally divided between whites and negroes. Most of the whites are Spaniards, and Spanish is the language of the island.

The surface is divided into three distinct areas ; the mountainous region occupying the eastern part, a central plain with scattered hills, and the mountainous region in the western part, which has a mountain axis whose slopes descend to the valleys. The coast is irregular and furnishes numerous good harbors. There are a number of rivers on the island, but they are short and of but little commercial value. The soil is fertile, and rainfall is abundant.

**Agriculture** Agriculture is the leading industry, and sugar constitutes the principal crop, Cuba leading the world in the out-put of cane-sugar. The next crop in importance is tobacco, which is grown with a greater margin of profit than sugar, and is exported in large quantities. Cuban tobacco is of the best quality, and commands the highest prices in all markets. For this reason tobacco from other countries is frequently shipped to the island and reshipped as the Cuban product.

**Other Resources** The forests contain a large quantity of valuable timber, and iron ore, copper, manga-

nese, asphalt and salt are found in sufficient quantities to admit of profitable working. Considerable iron ore is now mined and shipped to the United States since it is especially valuable in the manufacture of steel.

**Manufactures** Manufactures are limited almost entirely to cigars and other products of tobacco.

The oppressive Spanish rule and the war for independence destroyed most of the plantations and ruined all the industries, but with the aid of this country a new beginning has been made. An independent government, republican in form, was organized in 1902, with Tomas Estrada Palma as president, but after four years the United States was obliged to intervene and settle internal strife. The foreign relations of the Republic are subject to the control of the United States. Provisions for paying up the national debt have been made, a good system of schools, established while under the control of the United States, is maintained, and railways and highways are being extended.

**Cities** Havana, the capital and chief city, is situated on the north coast, and is a convenient port of call for vessels crossing the Atlantic. It is the commercial and financial center of the West Indies, the largest sugar market in the world, and the third city in the Western Hemisphere in foreign commerce. Its population is 359,200. The other important cities are Cardenas and Matanzas on the northern coast, and Santiago de Cuba and Cinfuegos on the southern coast. All these are connected with Havana by railway and telegraph and Havana has cable connection with the United States.

**Commerce** Nearly all the foreign trade is with the United States. Sugar and tobacco constitute the principal exports, but others of some importance are iron ore, honey, wax, hides and rum. The trade with the United States amounts to about \$1,460,000,000 a year, of which \$643,000,000 is exports,



and the balance imports, consisting of agricultural implements, cotton goods, boots and shoes, hardware, machinery, and vehicles.

**SAN DOMINGO** This island is divided between the negro republics of Hayti and San Domingo. The former has been fairly prosperous, but rebellions and revolutions in the latter have completely destroyed all industries and hindered civilization. In 1906 the financial affairs were placed under control of the United States until the foreign debt is paid.

**OTHER ISLANDS** The most valuable of the other islands are Jamaica and the Bahamas, both belonging to Great Britain. To the eastward of these lie the small group of the Danish West Indies purchased by the United States in 1917 and named the Virgin Islands, (see page 256), and the Virginian group; the Leeward Islands, the French Islands of Gaudeloupe and Martinique; the Windward Islands, including St. Lucia, St. Vincent, and Grenada; and the Barbadoes. All raise pineapples and other tropical fruits, and have more or less trade with the United States, but the larger part of the trade is with the respective home countries. Kingston on Jamaica is, next to Havana, the most important city of the West Indies.

## QUESTIONS

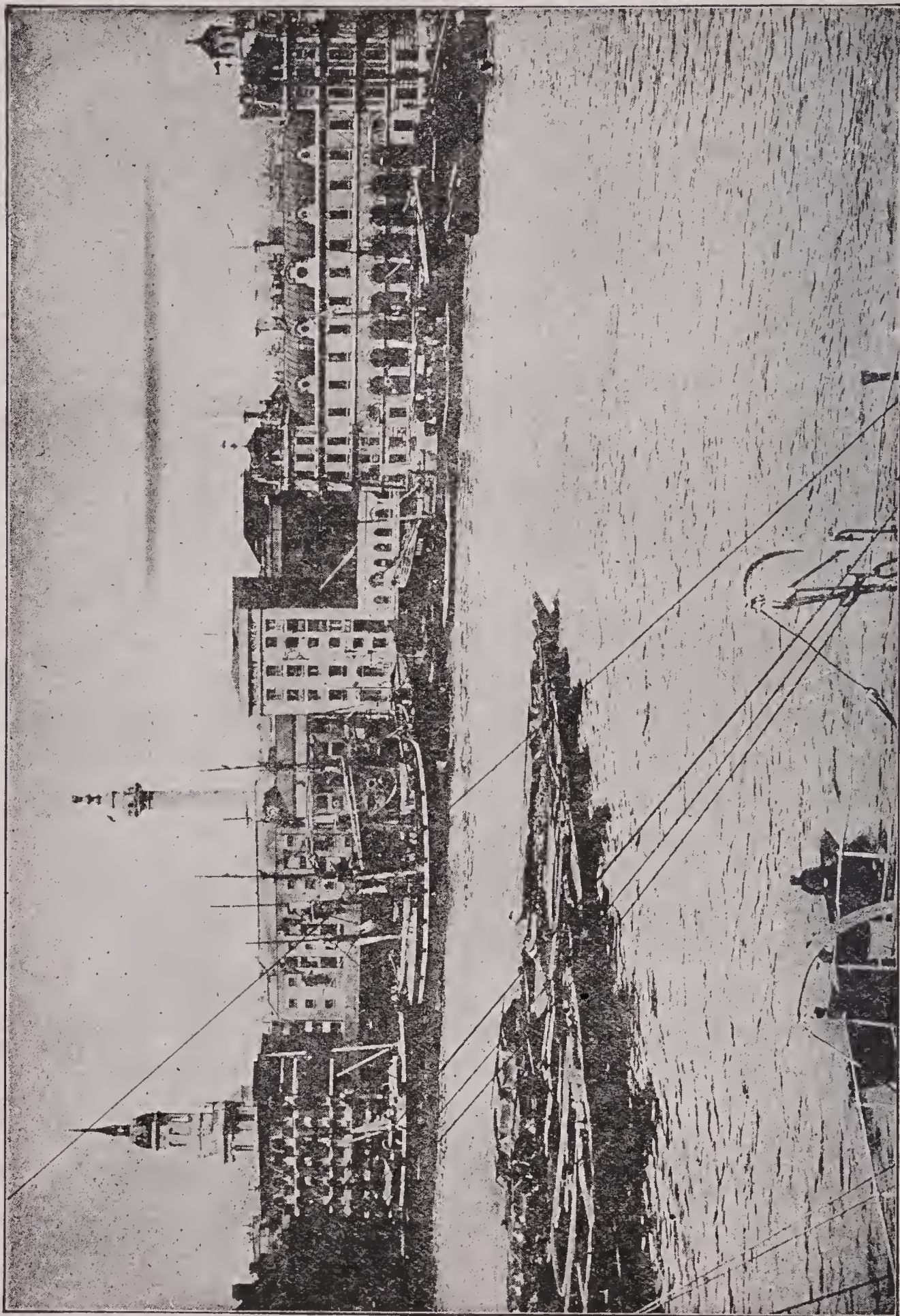
What commercial advantage does Cuba have over the other West Indies?

What are the most important products of Jamaica?

Why have Hayti and San Domingo such a limited trade?

How has annexation to the United States helped Porto Rico?





BILLINGSGATE MARKET, ON THE THAMES, LONDON



## CHAPTER V

### THE UNITED KINGDOM

**LOCATION** The United Kingdom embraces England, Scotland, Ireland and Wales. The British Empire includes the United Kingdom and all of her colonies. The area of the United Kingdom is about 121,000 square miles, or a little more than three times that of the state of Ohio. Its population is about 41,000,000, less than half that of the United States. The area of the British Empire extends over 11,500,000 square miles, and includes one-fifth of the land area and nearly one-fourth of the population of the globe.

**POLITICAL DIVISIONS** The important political divisions of the United Kingdom are: England, which is a little larger than New York; Wales, about the size of New Jersey; Scotland, about the size of South Carolina; and Ireland, which is but little smaller than Maine. England is the largest and contains three-fourths of the population of the Isles.

**AGRICULTURE** The location of the British Isles is extremely favorable for agriculture. Being in the path of the warm currents and warm winds of the North Atlantic, they have a temperate climate, with an abundance of rainfall, while their high latitude gives them long days during the summer season, and the large bodies of water surrounding them prevent sudden changes of temperature. All these conditions are favorable to the growing of crops. In the lowlands the soil is exceedingly fertile and it is remarkably well tilled. Hay, wheat and vegetables are the leading crops. The yield per acre in each is about double that secured in the United

States. Much of the land is held in large estates, which are divided into small farms that are kept in a high state of cultivation by the method of intensive farming, similar to that used by the truck gardeners near large cities in the United States, and almost universally practised. On the highlands and among the mountains, cattle and sheep are raised in large numbers, sheep being of special importance in Scotland.

Through years of careful breeding, the English farmers have attained the distinction of raising the finest cattle and sheep in the world. The cattle in the North are raised especially for beef, while those in the South are adapted to dairy purposes. Many of these breeds, such as Durhams or Short Horn, the Angus, the Ayrshires, Jerseys and Alderneys, have been imported to the United States, where they have supplanted nearly all of the older and less valuable breeds. The sheep produce the best quality of coarse and medium wool. Some portions of the Islands, especially Ireland, are devoted to the growing of flax.

All lines of agriculture are conducted on a scientific basis and the best possible results are obtained, but the agricultural products of the Kingdom fall far short of supplying the needs of the population and large quantities of food stuffs and raw material have to be imported.

**Fisheries** The fisheries are of considerable importance and occupy a good proportion of the inhabitants living along the coast in the northern part of the islands. Large quantities of herring are salted and exported, and fish of every variety supply the home markets.

**Mineral Resources** The abundance of iron and coal in England adapts that country to the manufacture of iron and steel products. Coal is found all the way from Southern Scotland to the Bristol Channel near the southern coast. **Extensive** deposits of iron are also found in the old worn-down



mountains adjacent to the coal fields. Tin and copper occur in considerable quantities, but the manufacturing industries require more of these metals than can be supplied from the home mines, and large quantities of each are imported. The coal supply, however, exceeds the home demand, and some coal is exported to the other countries of Europe.

**Manufactures** The peculiar advantages afforded for the manufacture of iron and steel and all articles made from them, have, until within a few years, enabled England to lead the world in the manufacture of iron and steel goods. The damp climate is especially adapted to the manufacture of textiles, because most fibers are more successfully worked in a humid atmosphere. These conditions, combined with the intelligence and genius of the English people, have for many years made England one of the leading manufacturing countries of the world.

Four inventions which have revolutionized the leading industries of the world are due to the ingenuity of Englishmen. These are the power-loom by Edward Cartwright, the steam engine by James Watt, the locomotive by Stephenson and the Bessemer process of the making of steel by Sir Henry Bessemer. Stephenson was not the original inventor of the locomotive, but he was the first to construct a practical road machine of this sort, and for this reason he is considered as the father of the steam railway.

The great manufacturing region is in the northern and western part of England. In the northwestern section of this district, the great cotton and woolen factories are found. Manchester leads the world in the manufacture of cotton goods and Leeds is the most important center in the woolen industry. England manufactures more textiles than any other country; her combined textile industries give employment to more than 5,000,000 people, and the products of her mills are found in all countries of the world.

The metal industries are next in importance to the manufacture





CHEAPSIDE, LONDON

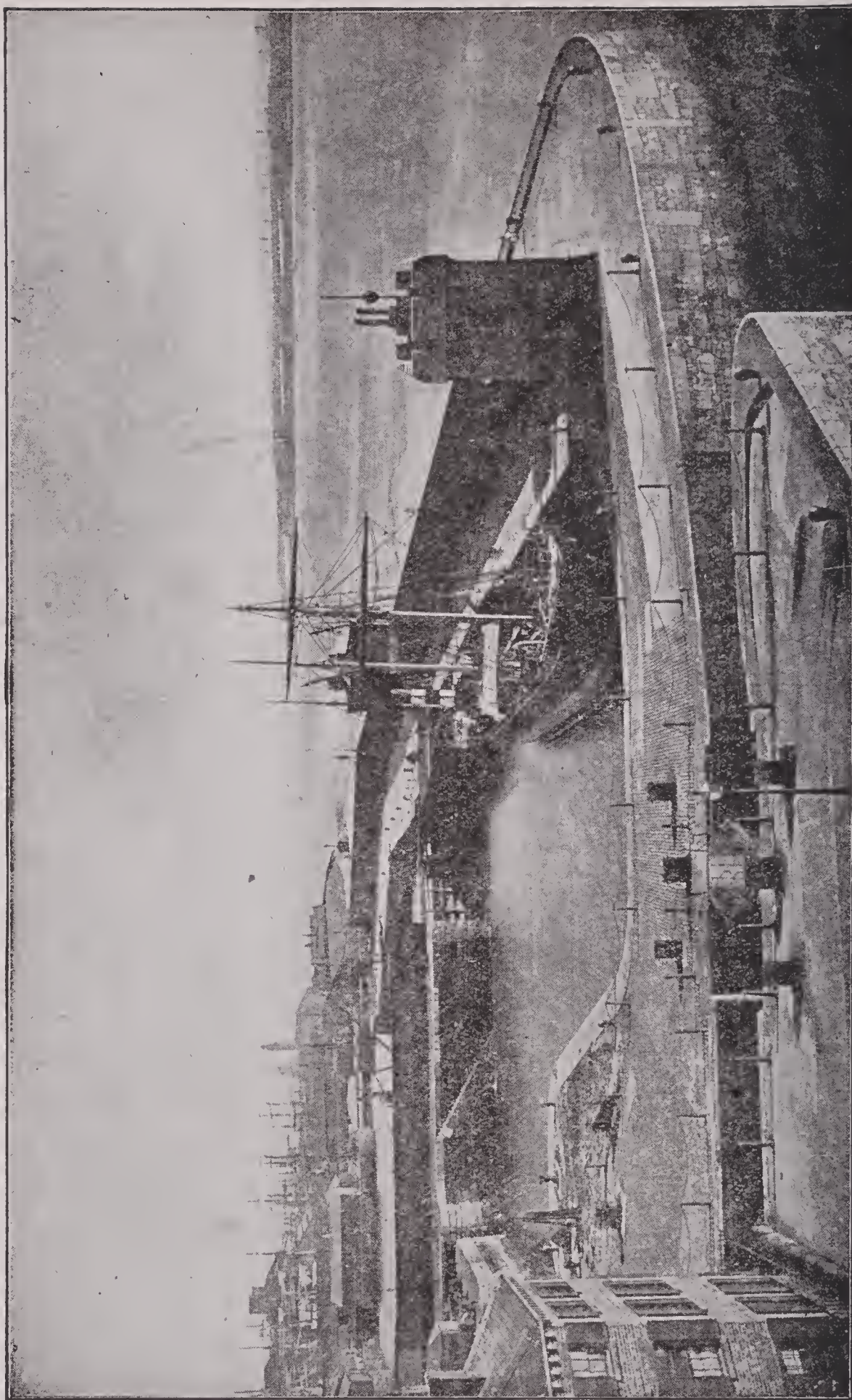


of textiles. In these iron and steel lead. Birmingham is the center of the iron industry and Sheffield is noted for its cutlery and tools. The abundance of iron and coal has also made ship-building an important occupation and some of the largest ship-yards in the world are found at Glasgow, where the majority of steamships sailing under all flags except the American, are constructed. These are the great manufacturing industries, but nearly all others, to a greater or less extent, are represented in the English workshops, there being scarcely an article in use among civilized people that is not made in the country. For many years England was the leading manufacturing country of the world, but she is now surpassed by the United States.

**Cities** Except in the northern part of Scotland, and some portions of Ireland, the country is densely populated. In England alone there are thirteen cities each having a population of more than 200,000. To this number must be added Glasgow and Edinburgh in Scotland, and Dublin and Belfast in Ireland. Most of the cities of the kingdom own their public utilities, such as lights, water-works, and street railways, and have attained a wide reputation for the excellent management and sound financial condition of these enterprises.

London, the capital, is the commercial and financial center of the empire and of the world. The area of Greater London is 693 square miles, or over one-half the area of the state of Rhode Island. In 1921 the population, including the metropolitan and police districts, was 7,476,168, which was equal to about two-thirds the population of the state of New York, including New York City. The city has grown at almost the head of tide-water of the Thames, whose broad estuary opens towards the rich lands of the continent. This location gives London great advantage as a "half way" station for the exchange of the products of the nations, and for centuries it has been the leading market of the world.





A VIEW IN THE DOCKS, LIVERPOOL



London is the center of the railway systems of the kingdom, as well as the focal point of many ocean routes, but the largest ocean liners anchor about twenty miles down the river on account of shallow water.

Liverpool is one of the most important seaports of Europe. It is the port through which passes nearly all the trade between the United Kingdom and the United States, Canada and other American countries. It has an extensive system of docks and is connected with Manchester by ship canal. The Cunard and White Star Steamship lines have their terminus here. Southampton is also an important port for American trade. Manchester has been made a seaport by the construction of its magnificent ship canal, which admits the largest vessels, and has its banks lined with wharves. Glasgow is noted for its great ship-building and iron and steel industries, and Queenstown is the port of call for many trans-Atlantic steamers.

**Transportation** The transportation facilities of the Kingdom are not surpassed by those of any other country. Excellent carriage roads extend everywhere, and the numerous railways join all towns with important centers of trade, and these with the great commercial and industrial centers. The railways are of the highest order of excellence, the best of mail, telegraph and telephone services are also maintained, and ocean cables extend to all parts of the world.

**Commerce** The British Isles are situated in the center of the land masses of the Northern Hemisphere. Commercially, this is a great advantage. Moreover, their small area places nearly every important manufacturing and commercial town within 50 miles of the sea. And, in addition to these local advantages, the British Empire has colonies in all parts of the world, with each of which most favorable trade relations are sustained. These conditions have made the United Kingdom the greatest com-

mercial and carrying nation of the world. The British merchant marine exceeds that of any other country. Before the World War it had nearly three times the tonnage of the merchant marine of the United States, and more than five times that of any other European country. Her merchant ships are a great source of wealth to Great Britain, since they enable her to do a large part of the carrying business of other nations, and a valuable revenue is derived from this carrying trade. British ships are found in every important port of the world.

Commerce is carried on with nearly all nations, but the United States, France, Germany, Netherlands and Belgium, in the order named, have the largest trade. The imports are foodstuffs and raw material for use in manufacturing. For this reason Great Britain has for many years been a free trade country, since, to place duties upon such imports would simply increase the cost of living, and cause hardship to the people.

The exports are manufactures and coal. English textiles are found in all lands and English hardware, cutlery, and machinery are exported to the British colonies and many of the countries of Europe and Asia. In addition to this, innumerable small wares, such as scientific instruments, pens, needles and pins, and others, that in the aggregate amount to a large sum, are sent to nearly all countries with which trade relations are sustained. The whole amounts to about two and a half billion dollars, one-fourth of which comes from the colonies, one-fifth from the United States, about one-tenth from France and the balance from other countries.

The imports from the United States are wheat, flour, preserved meat, beef cattle, cotton, and electrical machinery. The exports to this country consist of textiles and other manufactures. The annual trade with the United States amounts to \$2,348,880,000, of which \$1,825,000,000 is in imports from this country, and the balance is in exports.





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RELIEF MAP — EURASIA





## QUESTIONS

What made England for a long time the leading manufacturing country of the world?

How do you account for the number of large cities in England and Scotland? Why is the northern portion of Scotland sparsely populated?

What has given London its prominence as a financial and a commercial center? What city in the United States does it resemble in these respects?

What conditions have made Liverpool such an important seaport?

What natural advantages have aided in extending the commerce of the United Kingdom?

Why is such a large proportion of the foreign commerce carried on with the United States?



THE DOCKS, HAMBURG



## CHAPTER VI

### GERMANY

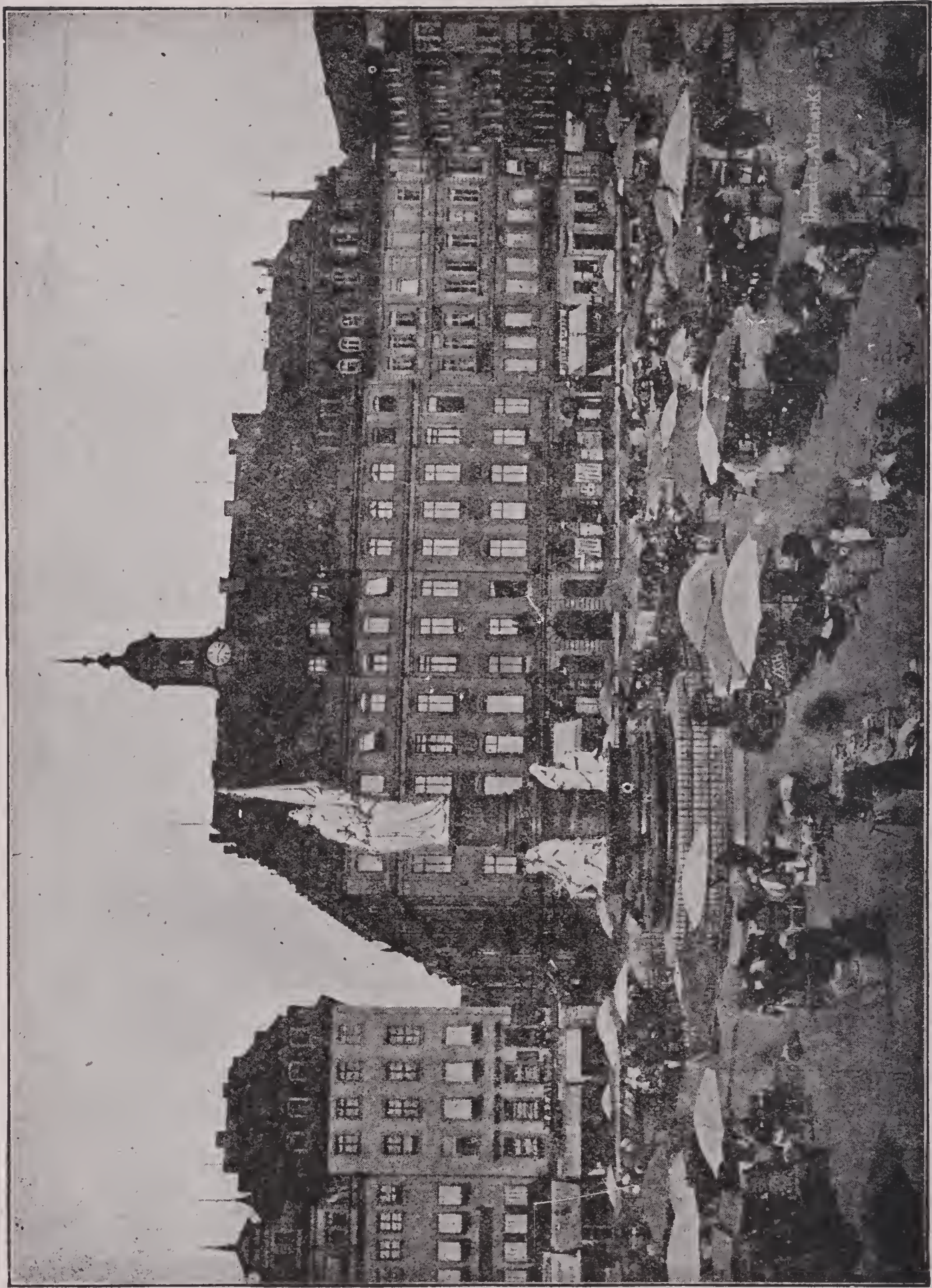
#### LOCATION

Germany is in the heart of Europe. It adjoins Poland on the east, Czechoslovakia, Austria and Switzerland on the south, France and Belgium on the west and Netherlands, Denmark and the Baltic Sea on the north. Before the war its area was about 262,000 square miles and its population about 70,000,000. By treaty of Versailles, Germany was required to cede some of her territory to surrounding nations, and her area has been reduced to 170,826 square miles and her population to 61,000,000. In the south the land is high and often mountainous, and the hill country prevails until the plains of Prussia are reached. These occupy the entire northern half of the country. The country has a temperate climate.

#### Agriculture

Agriculture is second in importance to manufactures and is one of the leading industries, engaging the attention of two-fifths of the people. Though in many localities the soil is naturally poor, yet owing to the great care taken with every little patch of ground and the skill with which the Germans manage, abundant crops are raised. In the southern and central parts of the country, rye, hops, grapes, wheat, barley and tobacco are raised, and the Rhine Valley is one of the largest wine-producing regions in the world. On the plains of Prussia, sugar-beets, rye, oats, and tobacco are raised. The sugar-beet is one of the most important crops and Germany was the leading country in the production of beet-sugar, its output being about one-fourth of the world's supply. Potatoes are also important. But none of these crops is sufficient to supply the country with food and the balance has to be imported. Cattle and hogs are raised in some





ALTMARKET. DRESDEN



sections and where grazing is good, dairy products are of considerable value.

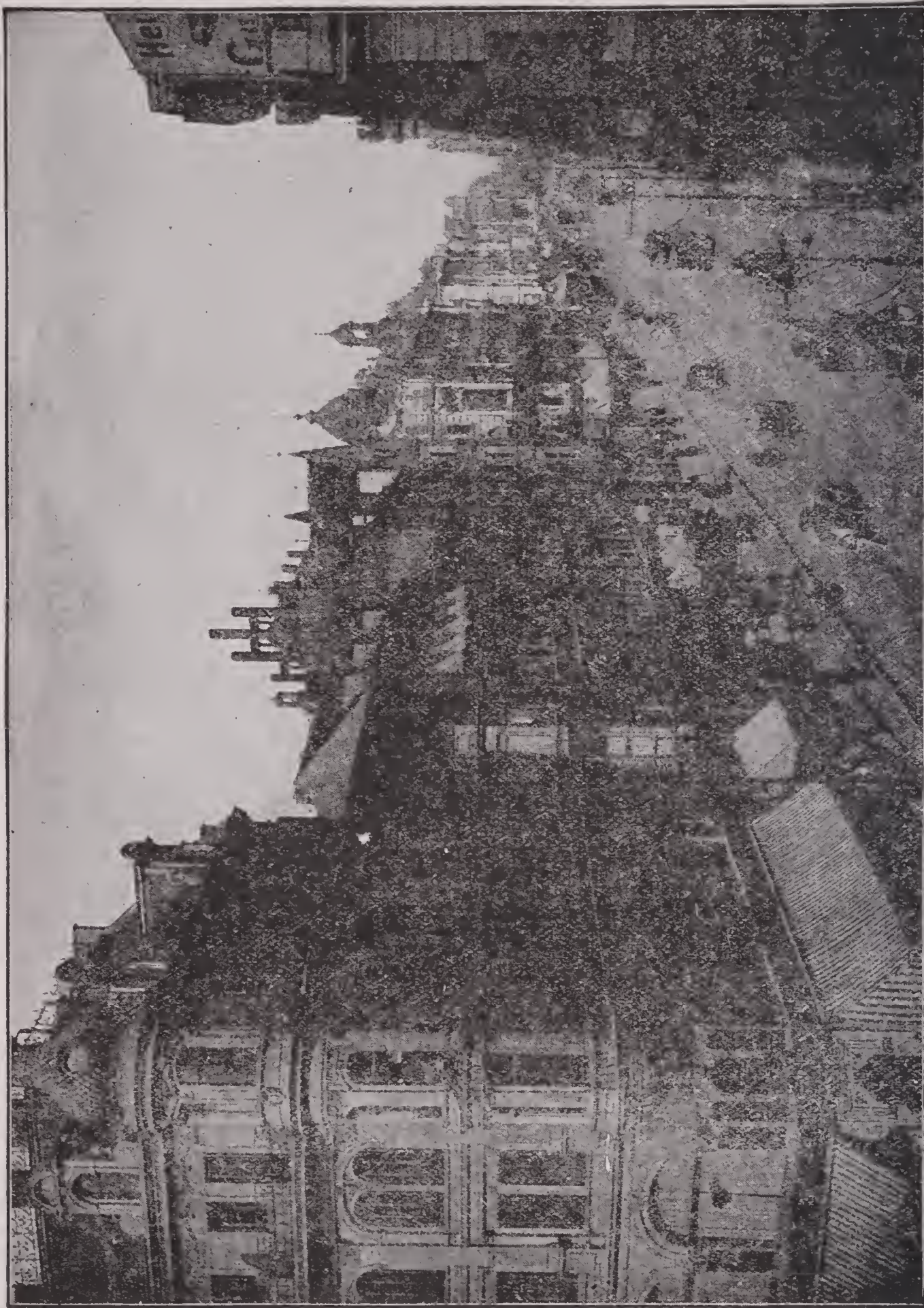
Forests cover one-fourth of the area of the country, and yield a good supply of timber and other useful products. All forests are under government supervision and their wise management prevents waste or destruction. A tree cannot be cut unless another is planted, so that the supply of timber does not diminish.

**Mineral Resources** Germany is rich in minerals. Silver, lead and copper ores are found in the mountains of Prussia, extending from Aachen on the west to upper Silesia on the east. Coal and iron occur in the Rhine Highlands, especially in the Ruhr Valley in the neighborhood of Aachen, where they become continuous with the coal fields of Belgium. Germany produces more coal and iron than any other country on the continent. She also leads the European countries in her output of silver. Zinc occurs in large quantities, copper is mined to a limited extent and most of the lithograph stone comes from Bavaria.

**Manufactures** As a manufacturing country Germany ranked third, being exceeded by the United States and the United Kingdom. Textiles and iron and steel goods are the leading products. These industries are principally located in the iron and coal regions of the south and southwest. At Essen are the Krupp Iron Works. Here were cast most of the large cannon for Germany, and here also is made much of the machinery for the largest ocean steamers; other heavy iron and steel work is also turned out in abundance.

**Transportation** All the important rivers are navigable, and are connected with each other by canals. Other canals also connect with the important rivers of France, Russia and Austria-Hungary, so that the inland water transportation is ample and cheap. Railways connect all towns of importance, and, in addition, important trunk lines lead to the





FRIEDRECKSTRASSE, BERLIN



prominent trade centers of all surrounding countries. Over 32,000 miles of railway are in operation, and the railway system of Germany is second only to that of the United States. The Baltic and the North Seas have 700 miles of coast, and the construction of the Kaiser Wilhelm Canal (see page 29) across the Peninsula of Schleswig-Holstein is of great advantage to commerce on the Baltic, since it saves the long and stormy passage of the Straits between Denmark and Scandinavia.

### **Cities**

Berlin, the capital, is one of the few cities having over a million inhabitants. It is an important industrial center and the leading financial center of Germany. It was formerly one of the most important financial centers of the world. Many of the leading railways converge here. Hamburg, at the mouth of the Elbe, has extensive docks, and was the most important seaport on the continent. It received all the American trade. Dresden is the center of the railway system of Saxony, and also has steamer connections with most of the leading ports of Europe. It is likewise an important manufacturing center. Königsberg is an important Baltic port. Breslau receives most of the raw material of Eastern Europe. Settin and Kiel have large shipyards where many of the finest German ships are built.

### **Present Conditions**

Early in 1919 the Imperial German Government was succeeded by the German Republic. The new constitution provides for a central legislative body known as the National Assembly, and for legislative bodies in each state. Full suffrage is granted all men and women over twenty years of age, and members of all legislative bodies are chosen by a direct vote of the people. The president is chosen by the National Assembly.

During the war, Germany succeeded in keeping the enemy from crossing her borders, consequently she escaped the devastation suffered by other countries. However, her resources were so severely taxed to keep her large army in the field and she lost so many of her most active men, that all her industries were badly crippled. Nevertheless, the people courageously set to work to restore their fields and fac-

tories to their former state of prosperity. In 1919 and 1920 good crops of wheat, rye, barley, oats, potatoes and sugar beets were raised and some manufactures were exported. It is probable that within a few years Germany's manufactures and commerce will be restored to their former position among the nations. Up to Jan. 1, 1921, no statistics of Germany's commerce had been given out since 1914.

### QUESTIONS

How does Germany compare with the United Kingdom in area? In natural resources?

How do German manufactures compare with those of England in kind and quality? Along what lines do the Germans excel? The English?

In what lines of manufacture does Germany compete with the United States?

How does Hamburg compare with Liverpool as a seaport?





## CHAPTER VII.

### FRANCE

**LOCATION** France is south of the British Isles and southwest of Germany. On the northeast it adjoins Belgium and on the southeast Italy. Its area is a little less than that of Germany, and its population a little less than half of the United States. The southern and eastern portions are mountainous, but the northern and northwestern portions are quite level, forming a part of the great plain that extends along the western coast of the continent. All the rivers have their source in the mountains. The climate is warm temperate, quite similar to that of the South Atlantic States. The country has a fertile soil, but the mineral resources are comparatively small.

**Agriculture**

Four-fifths of the land is divided into small farms which occupy one-half of the inhabitants. Though smaller than Texas, France has as many farms as the United States. They average in size from fifteen to seventeen acres and are cultivated on the plan of intensive farming, as in England. The most scientific methods are employed, and the land is in the highest state of fertility. Wheat is the most important cereal and the crop is of greater value than those of all the other cereals combined. Oats is the next cereal in importance, and rye and barley are grown to some extent. The sugar-beet is the most valuable agricultural product and is raised extensively on the plains in the north. France has over 500 sugar factories and produces about 833,000 tons of sugar annually. Tobacco is grown in some provinces, and is a government monopoly.

France is the leading country of the world in the production of grapes and wine; the soil and climate of the southern and eastern portions of the country being especially adapted to this industry. Grazing is the most important industry in the northern part of the country where cattle-breeding and dairying are a fruitful source of income to the farmers. Wool of excellent quality is also grown, and France is the original home of the Flemish and Percheron horses.

**Fisheries**

The fisheries are among the first in Europe; large quantities of cod are taken, and oyster culture is extensive. Most of the Atlantic fisheries are around the mouth of the Gironde, and most of the oyster beds are on the Bay of Biscay off St. Malo and in the English Channel. French oysters are inferior to the American varieties, but they find ready market at home.

**Mineral Resources**

France produces considerable coal, but not enough to supply her demands. Iron ore is also mined to some extent in Lorraine. The leading iron manufacturing factories are Lille, Nancy and St. Etienne. Salt mines occur near



Nancy, and large quantities are also obtained from the salt marshes along the Loire and Gironde.

**Manufactures** France is an important manufacturing country; although, in amount, her manufactured products fall far short of those of the United States, Great Britain or Germany, she excels in the quality of her goods. Shops and factories are found throughout the country, but the most extensive manufactories of iron and steel are in the north, in the region of the coal fields. The manufacture of textiles is one of the most important industries, and occupies over a million people. The silk industry centers in the Rhone valley, and Lyons is the leading silk market and the largest producer of silk textiles in Europe. The silkworm has been cultivated in Southern France for several centuries, but nine-tenths of the raw material is imported from Italy, China and Japan. Rouen has large cotton mills and Lille and Roubaix are also important centers of this industry. Excellent woolens are made at Roubaix and Tuscany, and Rheims and Lyons manufacture shawls. French woolens are noted for their fine texture and superior quality. Ribbons, kid gloves, hats, millinery, perfumery and numerous small wares, for the making of which the French people have a special aptitude, also constitute an important part of the manufactures.

**Transportation** France has an excellent railway system, of which Paris is the largest center. From here, railways extend to all of the principal industrial and commercial centers in the northern part of the country, and important lines extend south to Lyons and Marseilles. In all, there are about 24,000 miles of railroad, and a trunk line through the Mount Cenis Tunnel makes direct connection with Italy. The navigable rivers have been canalized, thereby greatly extending their mileage. Canals also connect these rivers with each other and with some of the rivers of Germany, forming a complete and extensive system of inland waterways.

**Cities** Paris is the largest city on the continent, the commercial and financial center of the country and the focus of a vast trade with surrounding countries as well. It has railway connections with all the important cities of Europe, and, through the Seine, excellent water communication with Great Britain and the continental seaports. It is the center of art and fashion and has become the great center for the distribution of luxuries of the



A VIEW ON THE SEINE, PARIS

civilized world. Paris is also famous for its manufacture of women's apparel, kid gloves, perfumery, porcelain and jewelry.

Lille, on the northern plain, is an important textile center. Rouen is the center of cotton manufactures and Lyons of the silk industry. The important seaports are Marseilles, Narbonne and Cette on the Mediterranean, Bordeaux on the Atlantic, and Havre, which is the seaport of Paris. Rouen, by the excavations in the



Seine, has also been made an important inland seaport. The importance of Marseilles has been lessened by the construction of the Mount Cenis, Saint Gothard and other tunnels through the Alps, since these give the country to the north direct railway connection with Genoa and other Italian cities.

Although a compact country, France presents a great variety of soil, climate and productions. The natural versatility of the French people enables them to adapt themselves to these conditions in a manner that assures success in whatever they attempt. They are full of life, open-hearted and honest, but withal energetic and earnest. Neatness and thrift characterize their every effort, and in France a larger proportion of homes is owned by their occupants, than in any other country. The thrift of the French is also manifested in their use of raw material. Nothing is wasted, and what is often rejected by other nationalities as worthless is here worked up into valuable by-products. Notwithstanding the disasters which France suffered in the World War, the people immediately set about restoring the country to its former state of prosperity, and by 1920 were exporting wheat and other products.

**Commerce** France has an excellent trade with other European countries and the United States. While this trade was cut off during the war, it was not permanently destroyed, and within a few years it will doubtless reach its former proportions, and possibly exceed them. The chief exports are woolens, silk, wine and many small articles, such as gloves, millinery, perfumery, porcelain and scientific instruments. The chief imports are breadstuffs, raw cotton, raw silk and wool. The largest trade is with Great Britain and the United States.

The colonial possessions of France exceed in area the entire United States and have a population of over 56,000,000. They lie chiefly in Africa and Southeastern Asia, and are important factors in the commerce of the mother country. Algeria and Indo-China are the most important commercially.

**Rehabilitation** In 1911 France had a population of 39,602,258. During the war 1,500,000 were killed and a much larger number incapacitated for work. The northern part of the country was devastated and the resources of the nation were completely exhausted. However, immediately after the armistice was signed the nation began to restore the devastated regions and to bring their industries back to a normal condition.

In 1920 it was estimated that the wheat crop would supply the demands at home and provide 100,000,000 bushels for export. Manufactures were somewhat retarded by the shortness of coal and the lack of raw material. The country is rich in iron and is destined to occupy an important position among the iron-producing countries of the world.

According to Lloyd's Register of Shipping, France had fallen to seventh place in ship building, placing her after Netherlands and Japan. Before the war, traffic in ships represented about one-half of the French trade. During the war the French merchant marine suffered heavy losses. But by 1920 the restoration of this loss was well under way through the construction of ships for France in the shipyards of Great Britain, Canada and the United States.

## QUESTIONS

Why is France able to support so large a population?

How do her methods of agriculture compare with those of England?

How do the manufactures of France compare with those of other countries, as to kind, amount and quality?

Why is so large a proportion of the foreign trade with Great Britain?

What are the means of communication with the countries to the south?





## CHAPTER VIII.

### BELGIUM, HOLLAND, DENMARK, NORWAY AND SWEDEN

#### LOCATION

Belgium, Netherlands or Holland, and Denmark occupy a section of the plains extending along the west coast of Europe, and a portion of Belgium and Holland is below the sea level. In Netherlands, considerable of this land has been reclaimed by building dykes and pumping out the water with windmills. On the low sand-barrens along the coast of Belgium, a similar work has been done by planting a grass that holds in place the sand which was formerly drifted by the wind.

**BELGIUM** Belgium is one of the smallest, most populous and most enterprising states in the world. With an area somewhat less than that of Maryland, the country supports a population of more than 6,000,000. The southern portion is high and broken, and the northern, low and nearly level. Though



A VIEW ACROSS THE BASIN, ANTWERP

naturally unproductive, by skilful tillage and the use of fertilizers, the soil has been made to yield abundant harvests. The sandy places along the coast have been transformed into excellent grazing lands and formerly supported large numbers of horses, cattle and sheep of the best breeds. This region is also the center





# EUROPE

Scale of Miles  
0 100 200 300 400  
The Geo. F. Cram Co.  
Chicago

Longitude 30° 40° 50°  
East from Greenwich 30° 40° 50°  
West 1° 2° 3° 4° 5° 6° 7° 8°





of an important dairy industry. Within this belt is one of more fertile soil, on which grains, the sugar-beet and flax are raised. The flax crop is very important since the fiber is of the best quality and is manufactured into textiles in the country.

There is quite an extensive coal field in the southern part of the country, and deposits of iron are also found in the same locality. Most of the coal mined is consumed by home manufactories, but a little is exported to France. Extensive zinc mines occur in Moresnet, and the production of metals and ores is an important industry. The southern part of the country is devoted to manufactures and is an important industrial center. The manufacture of cotton, woolen and linen goods and lace are the leading industries. The hand-made lace of Belgium is famous for its fineness and beauty, and commands a high price in all civilized countries. Porcelain, art-tiles, glassware and cheaper grades of all crockery are also made in large quantities in the coal region. All of these constitute important articles of export.

Brussels, the capital, is the most important city. Antwerp is the principal port and one of the chief seaports of Europe. Verviers, Liège and Seraing are important centers of the metal industry. Ghent is noted for its linens, and Mechlin and other towns in its vicinity for laces. The country is well supplied with railways which are under the control of the state. The Scheldt is navigable for ocean vessels as far as Antwerp, and is also connected by canals with the Rhine, which in turn is connected with the rivers of France.

Belgium suffered severely during the war and all her industries, except agriculture, were practically suspended. Her trade is chiefly with the surrounding European countries, especially France and Great Britain, and with the United States. The imports consist chiefly of foodstuffs and raw material used in manufactures, especially cotton and wool. The exports include iron and steel products, textiles, lace,

porcelain, glassware and coal. The United States sends Belgium wheat, cotton, corn and petroleum.

### **HOLLAND**

A large part of Holland is the delta of the Rhine. The country is a little larger than Maryland, and has a population of about 5,000,000. Agriculture, dairying and stock-raising are the most important industries. The soil and climate make grazing profitable, and the country is celebrated for its excellent breeds of cattle, horses and sheep. Agriculture takes the form of truck-farming and the growing of flowers, and the Dutch farmers supply vegetables, bulbs and cut flowers to many of the European cities.

Manufacturing is next in importance and consists of the making of cotton, woolen and linen goods, sugar, chemicals, agricultural implements, metal work, brick and pottery. Sandstone is quarried, and iron ore and coal are mined in small quantities.

The country is well supplied with canals, varying in size from those that will float large ships to mere ditches. These connect with the navigable rivers and with each other and furnish a complete system of waterways, which are supplemented by a railway system, having about half the mileage of the canals.

Amsterdam is one of the leading financial centers of Europe, but the carrying trade centers about Rotterdam, which, by improvement of its canals and rivers, has been transformed into a commodious seaport. Delft has a world-wide reputation on account of the pottery made there. The trade is principally with the surrounding nations and the Dutch colonial possessions. The leading exports are butter, cheese, sugar, vegetables, flowers, margarine and flax. The imports are food stuffs, raw materials and manufactures. Most of the exports go to Great Britain, France and Belgium. The trade with the United States is small, amounting to about \$163,600,000 a year,



more than three-fourths of which is imports. Like England, Netherlands has for centuries been a jobbing nation. The volume of trade handled by her people amounts to nearly \$1,500,000,000 a year. The Dutch merchant marine is large for the nation, well equipped and frequents all ports of the world. Much of the carrying trade is done for the Dutch East Indies, whose population and commerce exceed in value those of the mother country.



## DENMARK

Denmark occupies the peninsula of Jutland and a few adjoining islands. In area it is a little larger than Massachusetts, Connecticut and Rhode Island combined, and its population is about two and one-fourth millions, which is a little less than that of Chicago. Agriculture occupies about one-half of the people, manufacturing one-fourth, and fishing and trade the remainder. All available land is under cultivation, and excellent

crops of wheat and other cereals and roots are raised. Raising live-stock and dairying are also important industries. In the quality of her butter, Denmark excels all other countries. Manufactures are encouraged, but they are few and unimportant. The largest trade is with Great Britain and Germany. The exports are butter, eggs, lard and pork. The imports, food-stuffs and manufactured articles, principally textiles and hardware. Considerable trade is carried on with Iceland, from which fish, whale and seal are imported. Copenhagen is the capital and commercial center.



### NORWAY AND SWEDEN

Norway and Sweden occupy the Scandinavian Peninsula, the greatest part of which is a plateau, varying from 1000 to 3000 feet in altitude, being highest at the South. The combined area of these countries is 298,000 square miles, of which 125,000 belongs to Norway, and 173,000 to Sweden. Norway is a little larger than New Mexico, and Sweden is about the size of California and Maryland combined. The population of Norway is a little more than 2,250,000 and that of Sweden, is 5,000,000.



The coast of Norway is indented by numerous deep fiords, many forming good harbors. The southern and eastern slopes contain considerable lowland and the streams are small and rapid, affording good water-power, but being of little assistance to navigation. One-half of Sweden, and over one-fifth of Norway are



NORWEGIAN FISHERMEN DRYING FISH

covered with forests. Spruce, fir and pine predominate. Their latitude would give these countries an extremely cold climate, but under the influence of the winds from the Atlantic, this is modified to a cool temperate over most of the peninsula.

Until 1905 the two countries were under one government, but maintained separate legislative assemblies. Their industries are common, but Norway, being the more mountainous, gives less

the most celebrated is Port wine, which obtains its name from the city of Oporto. Barcelona is the financial and commercial center. Madrid is the capital of Spain, is of political significance, but has no commercial or financial importance, and the principal fruit ports are Malaga, Valentia and Cartegena.

**ITALY** A good portion of Italy is formed by a spur of the Alps which extends into the Mediterranean, and is known as the Apennine Mountains. In area the country is about equal to Nevada, and it has a population of about 32,400,000, or less than one-third that of the United States. The northern part of the country forms the southern slope of the Alps which descend to the Plains of Lombardy, through which flows the Po. The basin of this river is alluvial land of remarkable fertility. The Apennines extend through the central part of the Peninsula, and slope on both sides to the sea. Italy has the same latitude as the New England States, but its climate is much warmer and somewhat more arid.

**Agriculture** Italy has at all times been distinctly an agricultural country. The great Plain of Lombardy is the most important agricultural district. Its ranges of latitude and altitude enable the country to produce all of the crops of the temperate regions, and many tropical products as well, and the seasons are such that two, and even three, crops can be obtained during the year. Wheat is the most important cereal, but there is not enough produced to supply the needs of the population. Corn is raised in large quantities, and rice is grown in the irrigated regions. Olives constitute the most important of the agricultural products, and Italy leads the world in their production. Olive oil is extensively used by the inhabitants in place of butter, or other fats. Large quantities of the fruit and oil are also exported. Tropical fruits, oranges, lemons and grapes are extensively cultivated, and Italy ranks next to France in the production of wine.



## CHAPTER IX

### SPAIN, PORTUGAL, ITALY AND SWITZERLAND

#### SPAIN AND PORTUGAL

These countries occupy the Iberian Peninsula. Their surface is rough and mountainous, and with the exception of small areas around the coast, the land is high. The climate is semi-tropical, except in the highest altitudes, and the rainfall is not sufficient for extensive agriculture. Spain is about the size of California and Kentucky, and has a population of about 19,000,000, while Portugal is a little smaller than Indiana and has a population of 3,500,000. Though politically separate, industrially and commercially these countries are one.

The important agricultural products are merino wool, which is the finest in the world, and tropical fruits, including raisins, grapes, oranges, lemons, limes and olives, all of which are exported. Wine making is also an important industry, and a large share of the supply of cork comes from the interior. This is obtained from the bark of the cork oak, which grows nearly a foot thick.

There are good supplies of minerals, and the mines have been worked for centuries. Silver, iron ore and coal are obtained in paying quantities, and about one-half of the world's supply of quicksilver comes from the mines of Almeda in Spain. In general, the crudest methods are followed in mining and the reduction of ores, and the mineral resources are only partially developed. Manufactures are too limited to deserve any special notice.

The leading exports are wine, fruits, iron ore, merino wool and Malaga raisins, from Spain; and the export for which Portugal is

attention to agriculture than Sweden. The leading agricultural products are oats, rye, barley and potatoes. Considerable stock is raised, and dairying is likewise important in the low lands of the south. Ores of copper, silver, lead, iron and zinc are found, and mining is an important industry in both countries. The iron is of superior quality, and is exported to all iron-manufacturing countries. There is but little coal on the peninsula.

Manufacturing industries are few. The most important is lumber and lumber products, the Scandinavian countries being the largest exporters of lumber in Europe. Matches and wood pulp are made and exported in large quantities. Iron manufactures are second in importance. The manufacture of textiles is limited.

The trade is with Great Britain, Germany and Denmark. Only a small portion of the trade is with the United States. The exports are lumber, pig iron, dairy products, matches and wood pulp. The inhabitants of Norway are extensively engaged in fishing, and export cod and cod-liver oil. The imports are some food-stuffs and manufactured goods, principally textiles and machinery.

The leading cities are all seaports. Christiania, the capital of Norway, is at the head of the Skager-Rack; Stavengar, Bergen, Tromso and Hammerfest, the most northerly town of Europe, are important trade centers of Norway. Stockholm, the capital of Sweden, has an excellent harbor on the Baltic, and is the commercial and financial center of the country. Goteborg and Halmstad on the Cattegat are also important ports. The leading cities of both countries are connected by railway, there being about 7000 miles on the Peninsula.

Scandinavians are excellent sailors, and their ships are found in all the leading ports of the world, and, in proportion to its population, Norway has the largest merchant marine of any nation.



The most important single industry is silk culture, in which Italy is one of the leading countries of the world, ranking next to China and Japan. The industry is located principally in the northern part, where the mulberry thrives and the climate is especially suited to the growth of silkworms.

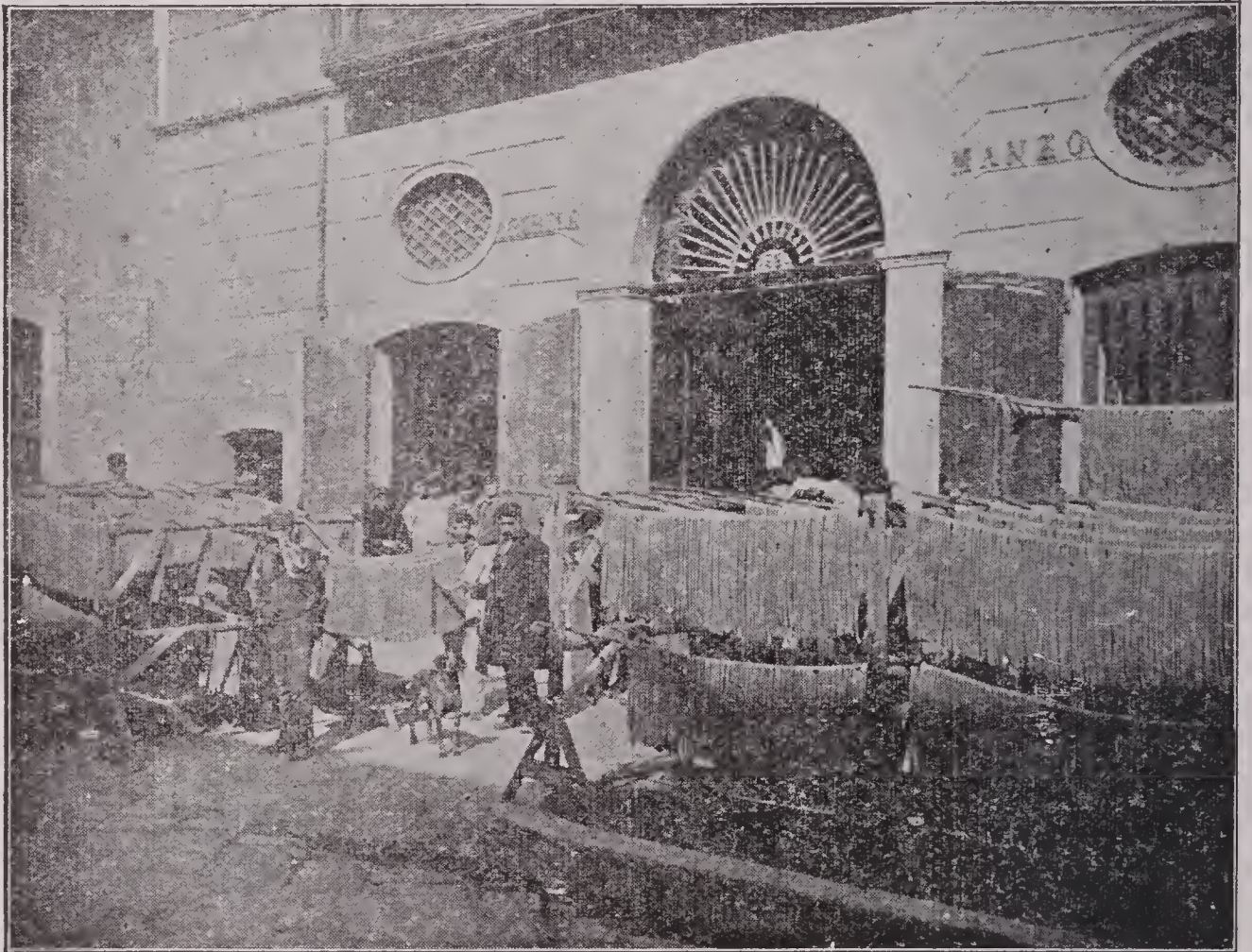
Notwithstanding the natural advantages of soil and climate, the Italian farmers are mostly poor, and receive but small returns for their arduous toil. Most of the land is owned by wealthy landlords, who rent it on such terms that the tenants are continually at a disadvantage and the methods employed in working the land, as well as the implements used, are of the most primitive sort.

**Minerals** The mineral industries are few. Carrara marble is the most choice stone for statuary purposes, and is exported to all countries. Most of the world's supply of sulphur is also obtained from the Island of Sicily, and some other volcanic regions. Iron ore is found in some localities, and is now being successfully worked under the fostering care of the government.

**Manufactures** The absence of coal limits the manufactures to textiles and straw goods, but the iron industry is being developed. The Italians have a special aptitude for the fine arts, and statuary, coral ornaments, mosaics and jewelry are the most important articles of manufacture. All these, on account of their excellence, command a high price in foreign markets. Much of this work is done in the homes of the workmen. There are but few large factories, or shops, even, employing any number of workmen. Macaroni, the most of which is consumed at home, is also produced in large quantities.

**Transportation** Italy occupies a central position on the Mediterranean. She has an abundance of sea coast and numerous good harbors. The other ports of the Mediterranean, as well as those of the East, are easily reached from her shores, and these advantages have given her a large carrying trade

and a goodly number of Italians follow the sea. The country also has a good merchant marine. There are about 10,000 miles of railways, which are organized into trunk lines extending along either coast. By means of the Mt. Cenis, St. Gothard and Simplon tunnels, trunk lines also connect Italy with France, Switzer-



DRYING MACARONI

land and the important centers of Europe, such as Vienna, Berlin and Paris. On account of these advantages most of the export trade is by rail.

**Cities** Rome, the capital, contains the Vatican, which is the residence of the Pope, and is the center of the Roman Catholic Church for the world as well as the center of government for the kingdom. It is more celebrated for its historic and artistic



associations than for its commercial importance. Genoa and Venice are the most important seaports. In the fourteenth century Venice was the commercial center of the world, but with the change in commercial routes she lost her prestige. Milan, in the northern part of the kingdom, is the great inland commercial city and the largest railway center of the country. Florence is noted for its art works. Palermo is the commercial center of Sicily, and Colonia, Brindisi, and Ancona are important ports on the Suez Canal route.

**Commerce** The annual exports amount to about \$284,000,000 and the imports to \$342,000,000. The exports are raw silk, olives, sulphur, marble, art works, and textiles. The silk and art goods go to France, the United States, and Switzerland and some of the cotton goods go to Turkey. The imports are cotton from Egypt and the United States, wheat from Hungary, manufactures and textiles from Great Britain and Germany. In the foreign trade Germany ranks first, followed in order by Switzerland, France, Great Britain, and the United States. The exports to this country amount to about \$54,333,000 a year, and the imports from us to about \$76,000,000. We buy the Italians' art goods and Carrara marble, olive oil and straw goods, and sell them cotton, agricultural implements, machinery, and hardware.

### QUESTIONS.

What is the difference between the agricultural methods employed in Spain and those in vogue in France and Germany? What is the cause of the difference?

Why are there so few manufactures in Spain and Portugal? What effect has this condition upon the commercial interests of these countries?

How do the agricultural methods employed in Italy compare with those in the United States? Would the Italians be successful farmers in the United States?

What commercial advantages does Italy derive from her geographical conditions?

What are the chief sources of Switzerland's revenue?

**SWITZERLAND**

Switzerland is an inland mountainous country lying wholly within the Alps. Its area is about twice that of Massachusetts, and its population is about 3,500,000. Seven-tenths of these are German, and less than one-fourth of them French. It is the land of lofty mountains, deep valleys and beautiful lakes and is famous the world over for the beauty and grandeur of its scenery. The valleys are fertile and wheat and other cereals and some vegetables are raised, but the supply is not sufficient to meet the needs of the people. The mountain farmers make excellent cheese, some of which is exported.

Switzerland is a manufacturing country, and most of its industries are highly specialized. The making of watches is the leading industry. Most of the work is done by hand, and, until the advent of the American machine-made watch, the Swiss watchmakers supplied the trade for many countries. Cotton and silk fabrics, and buttons and embroidery are also made. Many of the Swiss are skilled in engraving on wood, and produce beautiful and valuable specimens of art work. The exports are manufactured goods, and some condensed milk. The largest trade is with Germany, followed by Great Britain and France. Trade with the United States is inconsiderable. The Mount Cenis, Saint Gothard and the Simplon tunnels are of great advantage to the country because they have made transportation much cheaper, and given direct railway connection with surrounding states.

Geneva, at the head of the Rhine, is the chief trade center, and is noted for the manufacture of watches. Basel is the center of the silk industry, and Zurich has important cotton factories.



## CHAPTER X

### THE COUNTRIES OF SOUTHEASTERN EUROPE

The adjustment of political conditions after the World War led to the formation of several new countries in southeastern Europe and to the change of the boundaries of a number of others. However, these changes in political conditions have not affected the industrial and commercial conditions of this part of the continent.

**CZECHO-SLOVAKIA** The republic of Czecho-Slovakia is one of the new states formed after the dismemberment of the former Empire of Austria-Hungary as a result of the World War. It comprises the provinces of Bohemia, Moravia, Silesia, and Ruthenia which formed a part of Austria, and Slovakia, which formed a part of Hungary. It has an area of 54,500 square miles, or a little less than that of Illinois, and a population of over 13,500,000 or more than double that of Illinois. Czecho-Slovakia is rich in natural resources and is one of the most highly developed of the manufacturing countries of Europe, moreover, it is inhabited by an intelligent, industrious and educated people.

**Natural Resources** Agriculture is highly developed and intensive farming is practiced. The chief cereal crops are wheat, rye, and oats. Large quantities of potatoes are raised, and about a half-million acres are devoted to sugar beets annually. The beets contain a high percentage of sugar, and the beet crop forms the basis of one of the leading industries, making Czecho-Slovakia one of the chief countries of Europe in the manufacture of sugar. The country is also noted for its hops, which are of high industrial value.

Czecho-Slovakia is mountainous. Bohemia is surrounded by mountains, and the Carpathians extend through the other provinces. The country is one of the richest in Europe in forest resources, as over one-third of its area is covered by forests.

### **Minerals**

Every kind of useful mineral is found here. The country possesses abundant quantities of good coal and of iron ores, as well as copper, silver, gold, salt and oil. Czecho-Slovakia is one of the largest sources of supply of radium. The uranium and radium mines are located near Joachimsthal. Some of the largest mines of graphite in Europe are found near Budweis. The mineral springs of Carlsbad, Marienbad and Franzensbad are visited yearly by thousands of people from all over the world.

### **Manufactures**

Czecho-Slovakia is famous for its glass, which is exported to all parts of the world. The making of art glassware, in which the Bohemians excel, is an industry of great importance and one which has been established here for centuries. Porcelain is also manufactured, the china articles produced near Carlsbad being famous. The textile industry in all its branches—cotton, wool and silk—is on a large scale, the country possessing over two thousand textile mills. The iron and steel industry is also of large proportions, the chief products including railway rolling stock, agricultural machinery, arms and munitions. Other important branches are the manufacture of wood furniture, paper, and chemicals. As already mentioned, Czecho-Slovakia is one of the largest sugar manufacturing countries in Europe, having over 200 large and well-equipped sugar mills.

While the industries of this country are on a large factory scale, there are still a great number of articles, such as lace, toys and musical instruments, which are manufactured in the homes of the people and which have an established reputation for excellence that extends beyond the borders of the country.



**Transportation**

Czecho-Slovakia is an inland country and the greatest part of its commerce is carried by rail across the adjacent countries to Baltic and Adriatic ports. It is provided with excellent transportation facilities, both as regards railroads and waterways, and a great amount of its produce is carried on the Elbe and Danube. The Danube gives it access to the countries of the Lower Danube valley and an outlet to the Black Sea, while the Elbe gives it direct and easy access to the North Sea. Provisions have been made by treaty with Germany for using the port of Hamburg, which is situated at the mouth of the Elbe, for its foreign trade. Another navigable river is the Moldau, a tributary of the Elbe, on which Prague is situated. Besides these rivers the country is provided with a number of canals connecting the Danube with the Elbe and the Oder. The chief port on the Danube is Bratislava, while that on the Elbe is Aussig.

Czecho-Slovakia, especially the provinces of Bohemia and Moravia, is well-provided with railways. It has about 8500 miles of railways of which more than half are owned and operated by the Government.

**Commerce**

Czecho-Slovakia is very advantageously located as regards trade, being on the main trade routes between northern and central Europe and between eastern and western Europe. It has a very extensive foreign trade, the bulk of which is carried on with the neighboring countries of Austria, Germany, Hungary, Poland, Rumania and Italy, as well as with England and France. The trade with the United States is also of considerable importance and is growing larger. The chief exports to the United States are glass, chinaware, imitation jewelry and novelties, beads and sugar-beet seeds. The chief imports from the United States consist of raw cotton, agricultural machinery, tractors, printing machinery, hardware and tools. The natural resources of Czecho-Slovakia and her variety of manufactures will aid in increasing her commerce.

**Cities** The capital of the country is Prague, population about 250,000, one of the oldest and most picturesque towns in Europe. Besides being an important commercial and industrial town, it is also a center of learning and possesses one of the oldest universities in existence. Other important towns are Brno or Brunn, population about 125,000; Plzen or Pilsen, population about 80,000; and Bratislava or Pressburg, population about 75,000.

**AUSTRIA** The present republic of Austria occupies about one-fifth of the area of the former empire of Austria. It contains all the provinces of former Austria which are inhabited by Germans. In this respect the country possesses now a population of racial unity in contrast to the diversity of nationalities which the old state comprised. Austria has an area of 30,800 square miles or about equal to that of South Carolina and a population of about 6,200,000 or a little less than that of Illinois.

**Natural Resources** Austria is a mountainous country, being traversed in all directions by the Alps. Forests cover large areas and the timber resources of the country are of considerable value and are among its chief assets. The country has besides important mineral resources, especially coal, iron ore, copper, zinc, silver, gold and salt. In its numerous mountain streams and waterfalls Austria also possesses great potential water power. But the main occupation of the people is agriculture. Although intensive farming is practiced, the country does not raise enough food to supply the needs of its population. Large quantities of foodstuffs have therefore to be imported. The extensive pasture lands of the Alps offer great possibilities for cattle raising and this industry, as well as that of dairying, is highly developed and has attained large proportions.

**Manufactures** The production of textiles is the most important industry although the raw material—cotton, wool and silk—has to be imported. The manufacture of clothing and that of millinery are other well-developed branches of industry. The chief



seat of these industries is Vienna, where the workmen are renowned both for their taste and for their skill. The iron and steel industry located around Steyr and the manufacture of machinery both at this place and at Vienna are also of some importance. The manufacture of pianos, automobiles and paper are other well-developed branches of industry.

**Transportation** Austria is an inland country. Its only direct outlet to the sea is through the great waterway, the Danube, which puts it in communication with the countries of the Lower Danube valley. Its access to the Adriatic is by railway across northern Italy to the port of Trieste, which was formerly its principal seaport, but which now belongs to Italy. The country possesses an adequate system of railways.

**Cities** Over one-third of the total population of Austria is living in towns and more than twenty-five per cent is concentrated in Vienna, which has a population of 1,842,000. The capital of the country is Vienna, situated on the Danube, at a point where a series of passes in the Carpathian and Alpine Mountains gives it railway connections with the adjoining countries. Vienna is one of the oldest towns of Europe, but one of the handsomest, gayest, and most pleasant among all the larger towns of that continent. Before the war it was one of the most important financial and industrial centers of Europe. Other chief towns with their population are: Graz, 157,032; Linz, 93,473; Innsbruck, 55,659; Salzburg, 36,450; and Klagenfurt, 26,111.

**HUNGARY** The republic of Hungary occupies about one-third of the area of the former state of Hungary. The new state has an area of a little over 35,000 square miles or about equal to that of North Carolina and a population, according to the census taken in 1921, of 7,840,832, or a little more than the population of the New England States. The population is composed almost wholly of Hungarians, for as a result of the World War, all the territories inhabited by other nationalities have been assigned to the neighboring countries.

**Natural Resources** Hungary, which consists of broad grazing plains with a soil of great fertility, is essentially an agricultural country. Both the soil and climate are well adapted for the raising of wheat and corn, and large quantities of these cereals as well as of rye, oats, barley and potatoes, are grown. About two-thirds of the population is engaged in agriculture. Modern methods of cultivation and improved agricultural machinery and implements are used. The cultivation of grapes is quite extensive and wine of good quality is produced. Large quantities of other fruits are also grown. Raising live stock is carried on in accordance with scientific methods and many farms contain herds of high grade cattle, sheep and swine. Hungary has been for many years an exporter of all kinds of foodstuffs. Her agricultural resources assure Hungary a thriving commerce, for many European countries are waiting for her surplus of wheat and other agricultural products. Among her mineral resources are coal and iron.

**Manufactures** The most important industry is flour milling, which is centered at Budapest. Here some of the largest flour mills in the world are to be found. It is well to notice that the present process of making wheat flour by roller mills originated in Hungary. Other branches of industry are the manufacture of agricultural instruments, railway rolling stock and textiles.

**Transportation** Hungary is an entirely inland country and the Danube is its only outlet to the sea. Canals unite the Danube and the Elbe and railways connect all important cities.

**Cities** The capital of Hungary is Budapest, population about 950,000, beautifully situated on both banks of the Danube. It is not only the commercial and industrial center of Hungary, but also its intellectual center. It is next to Vienna the largest city in that part of the world and one of the most progressive in Europe. Other chief towns with their population are: Szeged, 120,000; Szabadka, 95,000; Debreczen, 95,000; and Ujpest, 60,000.



**JUGO-SLAVIA**

This is one of the new states formed as a result of the World War. It has been constituted by the union of the former kingdoms of Serbia and of Montenegro with the southern provinces of the former empire of Austria-Hungary, which are inhabited by Slavs, namely Bosnia and Herzegovina, Croatia and Slavonia, Dalmatia, and some other portions of the southern provinces of Austria and of Hungary. It is the largest state in the Balkan Peninsula proper, occupying the whole northwestern and central part of this peninsula, and bordering on the Adriatic Sea. It has an area of 95,630 square miles, or about equal to that of Oregon and a population of about 14,000,000, or a little more than double that of Illinois.

**Natural  
Resources**

Generally speaking, the country is mountainous, being traversed by numerous branches of the Alps. It is rich in natural resources, especially forests and minerals.

The forests occupy almost half of the total area of the country. The mineral resources include coal, iron ore, copper and gold, but they have not yet been exploited. In Jugo-Slavia, namely, at Idria, is found one of the largest quicksilver mines in Europe, producing over 125,000 tons of ore a year. Agriculture is, however, the chief occupation of the people. The country is divided into small farms, and as a rule the peasants are the owners of the land they cultivate. Fruit-growing and stock-raising are also very important branches of activity and large quantities of plums, as well as a great number of hogs, are annually exported. Silk culture is also actively pursued. Of manufacturing industries, flour milling is the most developed, followed by brewing, distilling and carpet weaving. The chief seat of carpet weaving, which forms one of the largest home industries of the country, is at Pirot, and the carpets are usually named after that place.

**Transportation**

Jugo-Slavia borders on the Adriatic Sea and its chief outlets are through the ports of Spalato and Cattaro, but the natural outlet for the northern part of the country is the port of Fiume. By treaty arrangements with Greece the country has an

outlet to the Mediterranean through the port of Salonica. The Danube, which forms for some distance its northern boundary, connects it with the other countries of the Danube Valley. Jugo-Slavia has about 2800 miles of railroads which are located mostly in the northern part and are owned and operated by the Government.

**Cities** Belgrade (population about 90,000), the capital, is situated on the Danube, and is on the main railway route from Central Europe to Constantinople. Other principal cities, with their population, are: Agram or Zagrab, 40,000; Monastir, 30,000; Prizrend, 28,000; Nish, 25,000; Djakova, 25,000; Serajevo, 15,000; Pirot, 12,000; and Cetinje, 5000.

**GREECE** Greece occupies the southern end of the Balkan Peninsula. It is rugged and mountainous, with a deeply indented coast. It has an area of about 59,000 square miles, or about equal to that of Georgia, and a population estimated at about 6,000,000, or a little less than that of Illinois.

**Natural Resources** Agriculture is the main occupation of the people, engaging about half the population, but only about one-fifth of the country is arable. Fruit is the most important crop and Greece is one of the largest producers of currants. Olives, figs, lemons and oranges are other important fruits grown, while tobacco is also largely cultivated. Among the mineral resources are iron, lead, copper, manganese and coal. Shipping is one of the most important and profitable undertakings of the people of Greece and the Greek merchant marine does a great deal of the carrying trade for the eastern Mediterranean countries. The Corinth Ship Canal, four miles long, shortens the route between Aegean ports and western Europe by over a hundred miles. Most of the foreign trade is with Great Britain, France, Russia and the adjoining countries. The trade with the United States is increasing. The carrying trade has fallen off, due to the disasters caused by the war.



**Cities** The capital of the country is Athens, a city famous in the history of civilization as the seat of the highest development of art, literature and philosophy. It is now a pleasant modern town with a population of 170,000. Its seaport, as in olden times, is Piraeus, population about 75,000. Other chief towns, with their population, are: Salonica, 160,000; Patras, 40,000; Corfu, 30,000; Volo, 28,000; Cavalla, 25,000.

**BULGARIA** Bulgaria is one of the countries occupying the basin of the Lower Danube, lying on the right bank of that river. It has an area of about 40,000 square miles, or just a little larger than that of Ohio and a population of about 5,000,000, or a little less than that of Ohio.

**Natural Resources** Bulgaria is an agricultural country and about five-sevenths of the people are engaged in agriculture. The land is divided into small farms and as a rule the peasants are owners of the land they cultivate. The methods of agriculture, while not altogether up-to-date, are nevertheless quite modern and intensive farming is practiced in many places. The chief products are wheat, corn, barley and oats, of which large quantities are exported. Among other products are tobacco, fruits, wine and silk. One of the special products of this country is attar of roses. The chief source of the world's supply of this product comes from a small region in Bulgaria, specially suited for the cultivation of roses. The Balkan Mountains which traverse the country from east to west are covered with extensive forests and contain also vast mineral resources which have, however, hardly been touched. The most important manufacturing industry is flour-milling.

**Transportation** Bulgaria borders on the Black Sea and the great bulk of its foreign trade passes through the ports of Varna and Burgas. The Danube also forms one of its chief arteries of communication. Trade is mostly with the neighboring countries, that with the United States being small. Railways connect the capital, Sofia





MAKING THE NATIVE BREAD IN THE STREETS OF BERKOVITSA, BULGARIA



(population about 130,000), with all the principal towns in the country and with the general European railway systems, as the main line from Central Europe to Constantinople passes through it. Other towns, with their population, are: Philippopolis, 50,000; Ruschuk, its chief port on the Danube, 40,000; Slivno, 20,000; Tirnovo, 20,000.

**ROUMANIA** As a result of the World War, Roumania has more than doubled its area and population and has become the largest and the richest country in the Balkan Peninsula. It occupies the basin of the Lower Danube, and this important river forms its southern boundary for a long distance before entering the Black Sea. It has an area of over 122,000 square miles, or nearly three times that of Pennsylvania, and a population of about 18,000,000, or more than double that of Pennsylvania.

**Natural Resources** Roumania is essentially an agricultural country. It has been for a long time one of the leading wheat producing countries in Europe, even before the addition of Bessarabia, which is a continuation of the famous black earth region of Russia and that of the Banat, one of the most fertile farming districts of former Hungary. About eighty-five per cent of the population is engaged in agriculture. Besides wheat, large quantities of corn, which forms the staple food of the people, barley and oats are produced, as well as large quantities of flax, fruits and wine. On account of the lack of education of the peasants, the methods of cultivation are not modern and intensive farming is not practiced except in the newly acquired provinces of Transylvania and Banat.

The Carpathian Mountains traverse the country in a large semi-circle. The mountains are covered with extensive forests which make the timber resources of Roumania very great. On the foothills of the Carpathians extensive oil fields are located, and Roumania is among the largest oil-producing countries in the world. The oil industry is of recent origin, but it has developed very rapidly. Large refineries are located at Ploesti and at the Black Sea port of Constanza, which





PLACE DU THEATRE, BUCHAREST, ROUMANIA



is connected with the oil fields by several pipe lines. Other minerals found in large quantities, but which have hardly been worked, are coal, iron ore, copper and salt.

**Transportation** Roumania has excellent transportation facilities. It borders on the Black Sea and through its port of Constanza, which is provided with modern facilities, is in direct communication with all parts of the world. The bulk of the cereals is exported through the Danube ports of Galatz and Braila. Roumania has about 4000 miles of railways which are owned and operated by the Government.

**Commerce** The foreign trade of Roumania is extensive, the chief articles of export being wheat, corn, other cereals, oil and timber products. The bulk of the trade is with Germany, Austria and the neighboring countries, but great quantities of cereals are also sent to England, France and Belgium. The chief articles of import are textiles, agricultural machinery, metals and manufactures of metals. The trade with the United States, which was quite unimportant before the war, is increasing.

**Cities** The capital of the country is Bucharest, with a population about 300,000. It is one of the most modern and beautiful cities in Eastern Europe, and it is called the Paris of the Orient. Other chief towns, with their population, are: Jassy, 90,000; Galatz, 90,000; Braila, 80,000; Brashov, 60,000, and Chuj, 100,000.

**POLAND** The republic of Poland is the largest and by far the most important new state reconstituted in Europe as a result of the World War. It comprises territories taken from Russia, Austria-Hungary and Germany—countries that dismembered the old state of Poland and divided it among themselves in the eighteenth century. Poland is one of the largest countries of Europe and has an area of about 150,000 square miles, or about that of California. Its population is estimated at about 35,000,000, or nearly one-third the population of the United States. It is a country rich in natural resources and

with a very favorable geographic location for trade. It lies almost completely in the Basin of the Vistula and occupies a great portion of the North European plain. It is located on the trade routes running east and west, from Russia to Germany, and north and south, from the Baltic to the Black Sea.

### **Natural Resources**

Poland is one of the richest countries in Europe as regards natural resources of all kinds. Its soil is very fertile and it has been estimated that about 85 per cent of its area is productive. Nearly half of the productive area is arable land, while about twenty-five per cent is covered with forests and the remainder consists of pasture and meadows. The chief crops are wheat, corn, rye, barley, oats and potatoes. The production of cereals is sufficient not only for the needs of the population but also to provide a large surplus for export. The production of potatoes, in which Poland occupies a leading place among the countries of Europe, is the basis of a large manufacture of alcohol, starch and other chemical products. Another important crop is that of sugar beets, and this country is one of the largest producers of sugar in Europe. Hemp, hops, tobacco and chicory are among other important products.

### **Forests and Minerals**

The southern part of the country is traversed by the Carpathian Mountains, which are covered with extensive forests. The area of the forests has been estimated at about 18,000,000 acres. The mineral resources are very great, Poland having some of the largest coal and iron ore deposits in Europe. The chief iron and coal districts are around Cracow, in the Dombrowa district, and those in Upper Silesia. Poland has besides extensive oil fields, which are situated in Galicia, and which contribute about five per cent of the world's total production of oil. Other minerals are zinc, in the production of which Poland is second only to the United States; lead and salt. The salt mines of Wieliczka, near Cracow, are the largest and most famous salt mines in the world. They have been worked for centuries and some miners live in the mines.



**Manufactures** Poland has all the necessary conditions for industrial development and is in fact one of the leading manufacturing countries. The chief manufactures consist of textiles, iron and steel products, chemicals, paper, sugar, wood products, leather and food products. There are also breweries, distilleries, and oil refineries. The chief seat of the textile industry is at Lodz, which was formerly known as the Manchester of Russia, and Bielsk. The chief seats of the mining and metallurgical industries are in Czes-tochowa, Upper Silesia and Cracow.

**Transportation** Poland is an inland country and is under a great disadvantage in not possessing a suitable seaboard. It has indeed a small strip of seacoast on which, however, no suitable port is located. The natural door for its foreign trade is Danzig, which is the port of the Vistula basin, but which has been constituted a Free State under the protection of the League of Nations. By a treaty signed between Danzig and Poland, these two states form a single customs territory, and in this way Poland has gained free and complete access to the sea. Besides the Vistula, the country possesses other navigable rivers as well as canals. Poland has about 8000 miles of railroads which are owned and operated by the Government.

**Commerce** Its geographical location as the gateway between the trade of Germany and Russia makes Poland an important trading region, as well as a highway for transit trade. Its foreign trade is extensive. The bulk of the trade is with Germany, which sends about three-fourths of the imports and takes about sixty per cent of the exports. Next in importance comes the trade with Russia, and then that with the other neighboring countries. The trade with the United States, especially imports, is quite large and is increasing steadily.

**Cities** The capital of the country is Warsaw, population about 850,000, which is an important industrial, commercial and railroad center. Other chief towns, with their population, are: Cracow,

200,000, the most important center of Polish intellectual and national life; Lodz, 450,000, one of the largest manufacturing centers in Europe; Lwow or Lemberg, 200,000, the capital of Galicia; Czestochowa, an important center of national and religious life, and Przemysl, 150,000.

### **UKRAINE**

The republic of Ukraine is one of the largest states formed after the dismemberment of the Russian Empire as a result of the Russian Revolution of 1917. This state occupies the southwestern part of Russia. It is bordered by the Black Sea on the south, by Rumania and Poland on the west, by White Russia and Soviet Russia on the north and by Soviet Russia on the east. The area of Ukraine is estimated at over 300,000 square miles, or about the combined area of Texas and Louisiana. The population is estimated at about 42,000,000.

### **Natural Resources**

Ukraine was one of the richest parts of the former Russian Empire, possessing a very fertile soil and large mineral resources, especially coal and iron. The Ukraine, which occupies most of the famous Black Earth region of Russia, is one of the chief granaries of the world. Of the total area about sixty-five per cent is arable land; about twelve per cent is pastures and meadows; about ten per cent forests, and only about five per cent unproductive land. The chief products are wheat, corn, barley, rye and potatoes. Large quantities of sugar beets are also raised, making it an important sugar manufacturing country. Cattle raising also forms an important branch of activity and is a great source of wealth. The mineral resources are great. The iron and coal fields situated on the Donetz River are among the most extensive and richest in Europe. About seventy-five per cent of the total output of coal and iron of the former Russian Empire was produced here.

### **Manufactures**

Ukraine was one of the most developed regions of the former Russian Empire from an industrial viewpoint. The Donetz Basin is the seat of an extensive iron and steel industry. Next in importance is the sugar industry.



**Commerce** The Ukraine is a large exporter of cereals, especially wheat, and of sugar, besides supplying part of Russia with foodstuffs, coal and iron. Textiles are the chief manufactured articles imported.

**Transportation** The Ukraine borders on the Black Sea, and has several good seaports, the chief one being Odessa. It is traversed from north to south by several navigable rivers, such as the Dnieper, the Bug, and the Donetz. It is provided with about 12,000 miles of railroads.

**Cities** Kiev, the capital, with a population of about 600,000, is picturesquely situated on the Dnieper, and is called the "City of a Thousand Spires," on account of its numerous churches and monasteries. Kiev is one of the oldest towns of Russia and has been for centuries the center of the intellectual and national life of the Ukrainian people. Other large cities with their population are: Odessa, 650,000, the chief port of the Black Sea, provided with the most modern facilities for handling a large trade, and one of the most beautiful and modern cities in Europe; Kharkov, 260,000; Ekaterinoslav, 220,000; Nikolaev, 100,000, and Voronezh, 100,000.

## QUESTIONS

What conditions are favorable to commerce in Czecho-Slovakia?

What country formed from Russia is noted for its production of wheat?

What country in southeastern Europe enlarged her boundaries as a result of the World War?

What form of government have most of the countries of southeastern Europe adopted?



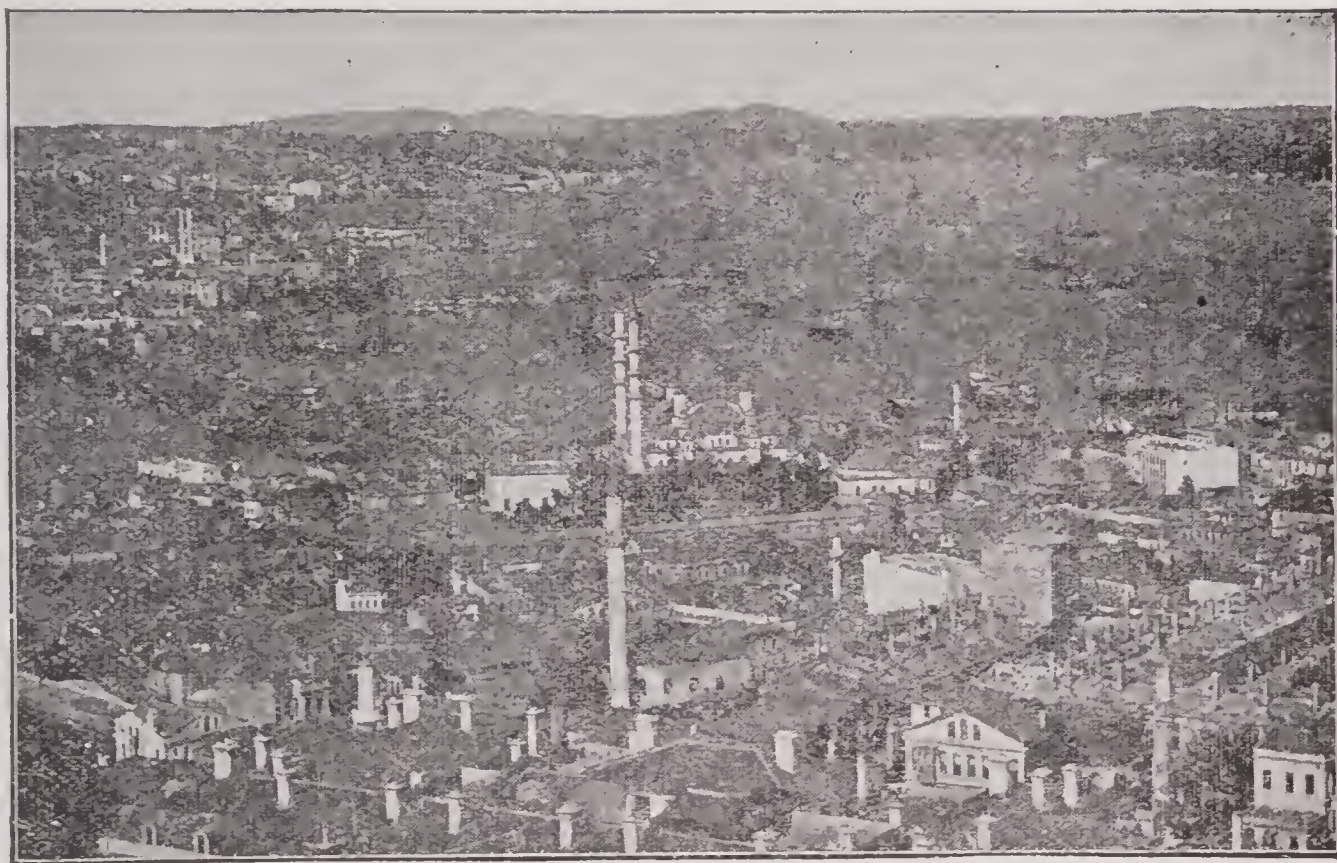
PANORAMA OF THE BOSPORUS



## CHAPTER XI

### TURKEY

**Position** As a result of the war Turkey, which still occupied a large part of the Balkan Peninsula and a great amount of territory in Asia, has lost almost all its possessions in Europe except



THE HARBOR, CONSTANTINOPLE

Constantinople and most of its territory in Asia. It occupies at present an area of about 175,000 square miles and has a population of about 8,000,000, as compared with an area of 613,000 square miles and a population of 21,000,000 before the war. Almost the only part left today is Asia Minor, which borders on the Mediterranean and the



Black Sea. After the defeat of the Greeks in 1922, Thrace as far as the Mareth River was returned to Turkey.

### Natural Resources

Agriculture, which is the chief occupation of the people, is in a backward condition, although the soil is very fertile. The chief products are cereals of all kinds,



CITY OF JAFFA, THE ANCIENT PORT OF PALESTINE

cotton, tobacco and fruits, such as grapes, figs and nuts. The production of silk is quite important. Grazing is an important industry in some sections and wool and mohair, the wool of the angora goat, are exported. The country has large timber resources but they are not properly worked. Turkey does not possess any manufacturing industries worth mentioning, with the exception of the manufacture of rugs and carpets. The rugs are famous for their beauty and command high prices in all civilized countries. Commerce is mostly with the neighboring countries, that with the United States being very small.



**Cities** Constantinople was the chief center of trade as well as the capital of the Empire. It is situated on the Bosphorus and commands a strong strategic position which gives it an importance it could not have from its commerce and industries alone. It is connected with European cities by railway and with the east by railways and by caravan routes, and carries on a trade with nearly all the countries of the world. Other important cities are Smyrna on the Mediterranean, an important seaport with direct communications with most of the European ports: Brussa, the former capital of the Empire, and Sinope, a port on the Black Sea. Angora, which was made the capital of the new government, has become one of the most important cities, politically, in Asia Minor.

**SYRIA** Damascus, the principal city of Syria, is the starting point for caravans to various sections of Asia, and Beirut is an important center for the manufacture of textiles. It is connected with Damascus by railway. Most of the trade is with European countries.

The United States imports from Turkey opium, ottar of roses, rugs, wool, gums, hides, silk and Turkish tobacco. Our exports are very small, amounting to about \$2,000,000 a year.

## CHAPTER XII

### BALTIC STATES AND FINLAND

#### BALTIC STATES

The Baltic States comprise Esthonia (23,160 square miles), Latvia (24,440 square miles), and Lithuania (59,633 square miles). The entire area of these countries is a little more than that of Colorado, and their entire population in 1921 was 8,053,000. In 1918 each country withdrew from Russia and established a republic. The following year the Soviet Republic recognized each of the governments and thus opened the way to their recognition by the other governments of Europe and by the United States.

Extending along the Baltic Sea from Eastern Prussia to the Gulf of Finland, these countries occupy an important commercial position. The land along the coast is low; inland most of the region is heavily timbered. The valleys are fertile and agriculture and lumbering are the chief industries.

Since their independence the Baltic States have made rapid progress along all industrial lines. Riga, the capital of Latvia, is a city of over 245,000 inhabitants and is one of the most important ports on the Baltic. Memel in Lithuania and Reval in Esthonia are the other seaports. The trade is principally with Germany and the other countries bordering on the Baltic Sea.

#### FINLAND

Finland was formerly a part of Russia, but it became independent after the World War. It extends from the Gulf of Finland to the Arctic Circle. Norway forms the northern boundary, Russia the eastern, and on the west it borders on the Baltic Sea, the Gulf of Bothnia and Sweden. The area, 149,586 square miles, is a little larger than that of Montana, and the population in 1921 was 3,368,000.



The surface is low and level and the country contains thousands of lakes. A large part of the land is heavily forested, but the open spaces have a fertile soil and agriculture is the most important industry. The climate is characterized by long, cold winters and short, hot summers, during which vegetation grows rapidly and large crops of rye, oats, wheat and potatoes are raised. Facilities for grazing are excellent and dairying is an important branch of agriculture. Lumbering and the manufacture of lumber products furnish employment for a large number. Other manufactures include flour and grist mill products and textiles.

Helsingfors, the capital, has over 189,000 inhabitants and is the most important city. Viborg and Kronstadt are the other seaports. Kronstadt was formerly the port for Petrograd and enjoyed a thriving trade. However, the completion of the ship canal to Petrograd and the decline of Russian industry have deprived it of much of its commercial importance.

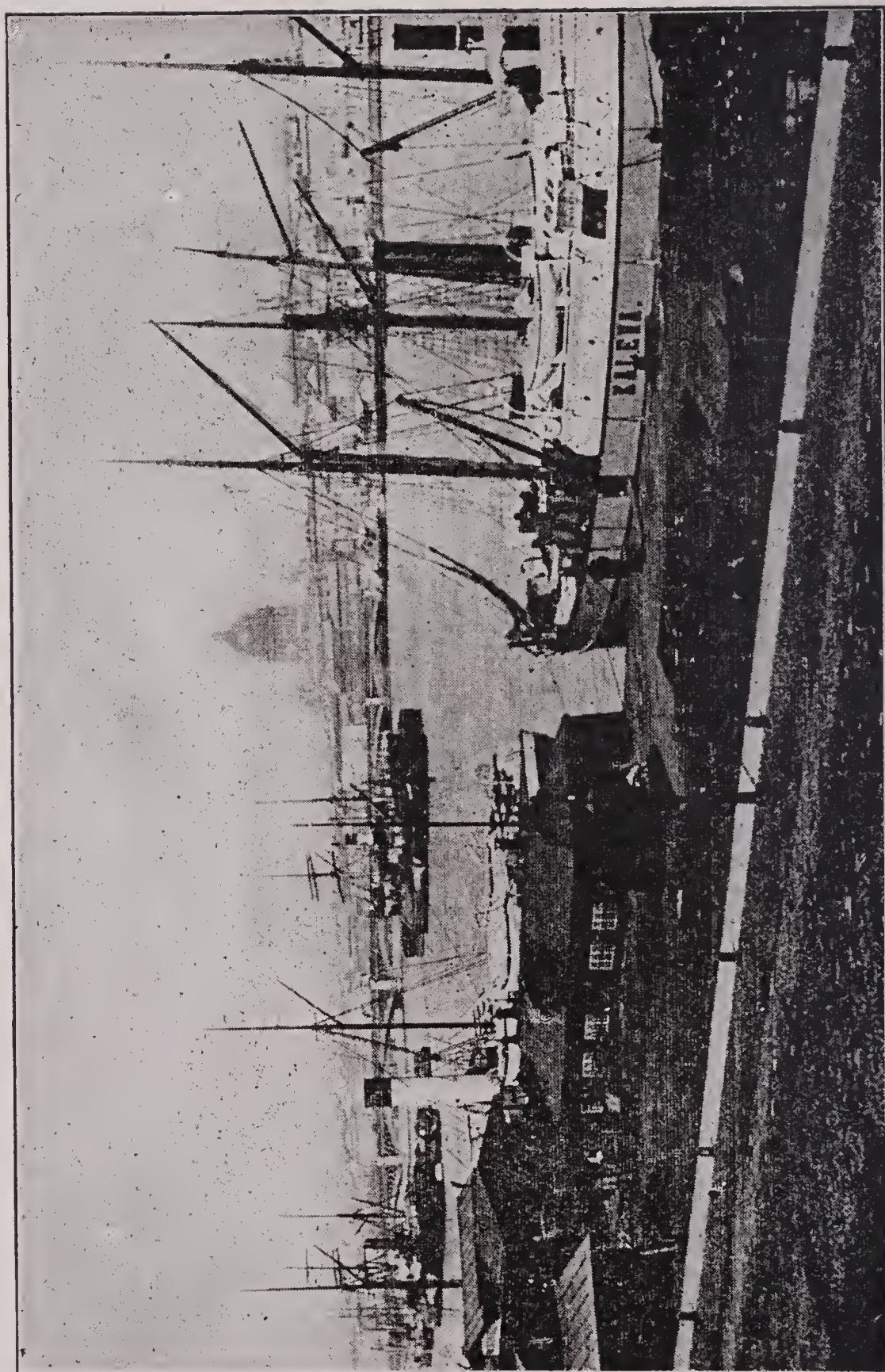
The Finns are a highly moral and industrious people. In appearance they bear a resemblance to the Mongolians, to whom they are distantly related. Education is general and all children of school age are compelled to attend school. The country is making rapid progress and has excellent prospects for becoming commercially strong in the near future.

## QUESTIONS

What commercial advantages have the Baltic States? What must be their chief exports?

Why can large crops be raised in a country so far north as Finland?

Why are the Finns likely to succeed as a nation?



PETROGRAD FROM ACROSS THE NEVA



## CHAPTER XIII

### RUSSIA

#### **Position and Extent**

The country of Russia occupies one-half of Europe and Asia, contains one-seventh of the land of the globe and, in area, ranks next to the British Empire. With a few exceptions, it is a vast plain, extending from the Baltic Sea to the Pacific Ocean—a distance of 6000 miles—and from the Black Sea, Persia, and China on the south to the Arctic Ocean on the north. Its territory is compacted into one great land mass between the different parts of which there are no obstructive barriers. The area is 6,320,000 square miles, and the population is over 103,768,000. The entire region is in the cool temperate and frigid zones. The country comprises Russia in Europe, Siberia, Trans-Caucasia, and Trans-Caspia.

#### **Russia in Europe**

This division comprises about one-half of Europe, and includes about one-fourth of the area of the Empire. It is a vast plain, extending from the Black Sea to the Arctic Ocean, and from the Baltic States to the Ural Mountains. The northern third is too cold for agricultural purposes. The middle portion is covered with heavy forests of valuable hard and soft woods. The southern part was formerly the granary of Europe. Rice, oats, wheat and flax were raised in large quantities, and previous to the World War Russian wheat competed with that from the United States in the markets of Europe. The Soviet Government disorganized the system of tilling the soil which had been in vogue for generations, and since 1917 Russia has not produced enough wheat to supply the needs of her own people. The methods

employed are primitive and the rate of production is low. Most of the Russian farmers, or peasants, are too ignorant to compete successfully with the farmers of Western Europe or the United States.

**Minerals** The mineral resources are abundant. Coal is found in Poland and the basin of the Don. Iron ore occurs in Poland and various other localities, and gold and platinum are



A FLOUR MILL ON THE TRANS-SIBERIAN RAILWAY

found in the Ural Mountains, where nine-tenths of the world's supply of platinum is obtained.

**Manufactures** Manufactures are rapidly on the increase, and now most of the iron and steel goods and railway supplies are made within the country. There has also been a large advance in the manufacture of textiles, and Russia has become an exporter of the coarser grades of cotton and linen fabrics.



**SIBERIA** Siberia is a vast plain which climatically can be divided into three sections. The agricultural section of the south, the forest and mineral belt occupying the middle portion, and the frozen tundras of the north. The agricultural district has a warm and somewhat arid climate, but is well suited to growing cereals, and most other crops of the temperate latitude. For its adaptation to hard grained wheat it rivals Minnesota, Dakota and Manitoba. Some of the agricultural sections also produce oats and rice in abundance. The forest belt is a series of vast resources which have not yet been developed. In the near future this region will furnish the timber supply for Europe. In area, the forest belt is second only to that of North America. Gold and iron abound. Gold mines are also worked along the Amoor River in the northern division, which in other respects is a worthless waste of frozen tundra.

**TRANS-CAUCASIA** This division of the Empire lies between the Caucasus Mountains and Persia. It contains numerous fertile valleys and is almost entirely devoted to agriculture. It is also rich in petroleum. Baku on the Caspian Sea is the center of the oil fields, the annual output of which is a little more than that of the United States. The oil is transported by rail, steamer and pipe lines. Copper, salt, iron, coal and manganese are also found in Trans-Caucasia, and are mined to a limited extent.

**TRANS-CASPIA** This division embraces Turkestan, and the region to the north, including the basins of the Ann and Daria Rivers. Lack of moisture renders a large part of the region unproductive, and none of its resources have been well developed. The leading manufactures are cotton and silk fabrics and leather goods.

**Transportation** The many long and sluggish rivers of European Russia furnish an extensive system of

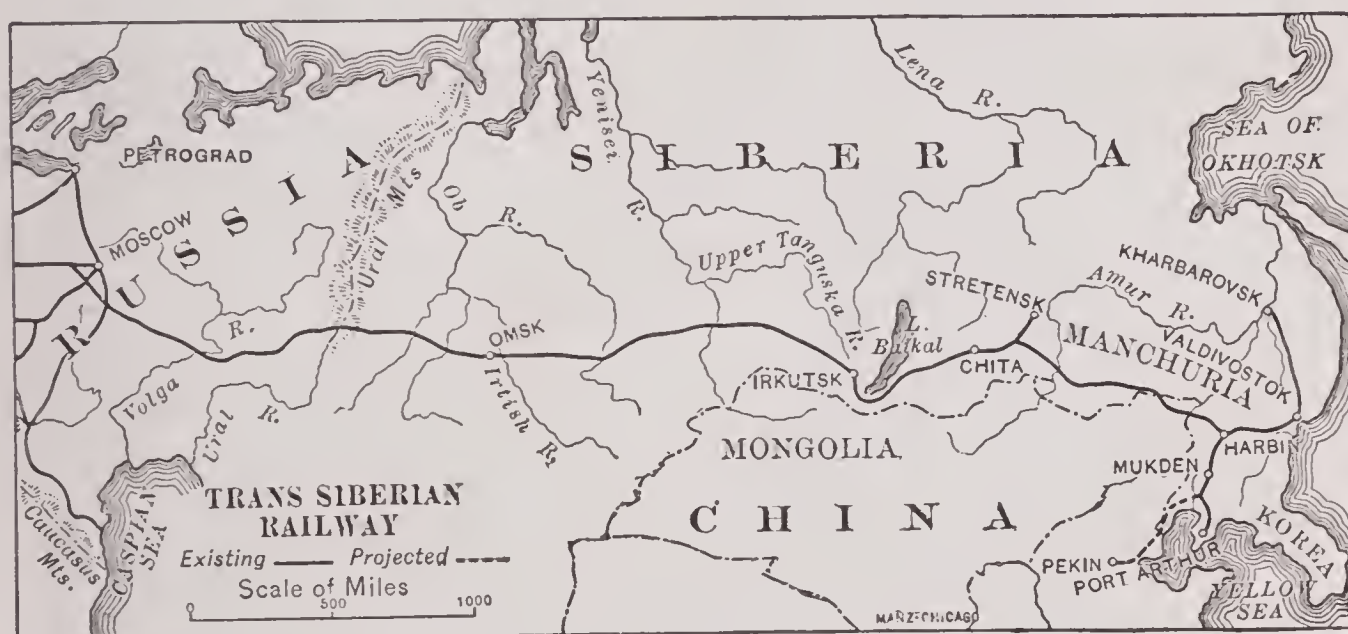


TOWER OF IVAN VELIKI, THE GREAT BELL, AND THE KREMLIN, MOSCOW



waterways, the Volga and its tributaries alone having over 7000 miles. These rivers have been extensively canalized, and also connected by an extensive system of canals, so that there are now almost 50,000 miles of inland waterways in the country. The ease with which canals could be constructed delayed the building of railways to a late date.

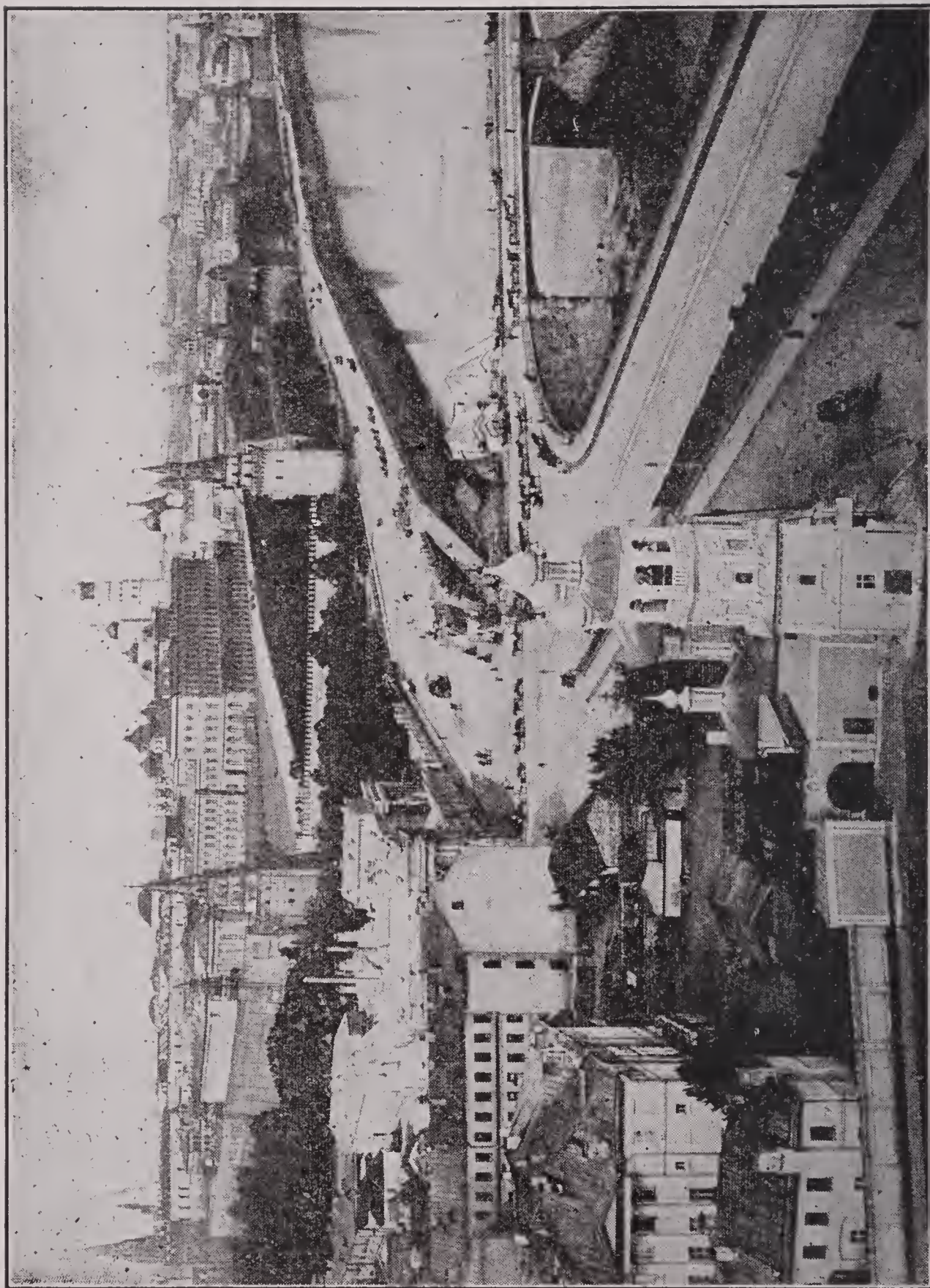
Petrograd and Riga on the Baltic, Archangel on the White, and Odessa on the Black Sea, are important ports, but the northern ports are closed the greater part of the year by ice, and



Odessa has an outlet to the sea only through waters controlled by other governments. Previous to the war with Japan, Vladivostock and Port Arthur, which was leased from China, were the important ports on the Pacific.

The railway system of Russia embraces about 40,000 miles, all of which is under the control of the state. All of the leading cities of European Russia are connected by rail, and a line has been built from Baku through the entire length of Trans-Caspia; but the greatest achievement in railway building was in the construction of the Trans-Siberian Railway from Petrograd to Vladivostock and Port Arthur, a distance of 6000 miles. The





MOSCOW



completion of this road opened to settlement and usefulness the vast Siberian territory with all of its agricultural, forest, and mineral resources, and placed the ports of China and Japan within sixteen days' journey of Western Europe. If placed upon the map of North America, this road would extend from the extreme point of the Peninsula of Alaska to Nova Scotia. It is the longest completed trunk line of railway in the world.

**Cities** In addition to the seaports already mentioned, the following cities are of importance: Petrograd, former capital, in 1920 had a population of 705,000. It is situated on the Neva, and is the farthest north of any large city. The ship canal, completed in 1885, makes it a seaport, and it is also connected by canals with the large rivers of European Russia. Petrograd is an important railway center, and the commercial and financial center for the northern part of the country. Important manufactures of cotton and linen goods, also of iron and steel, are located here. Moscow, the capital, is the most important railway center, and one of the largest manufacturing and commercial cities of Russia. Astrakhan is the center of trade for the country to the southeast. Baku is the great petroleum market, and Odessa is the most important port on the Black Sea.

Nijni-Novgorod is the city in which the great annual fair is held. In July of each year, the merchants from Western Europe and from Asia gather at this city for the purpose of buying and selling and exchanging goods. Nijni-Novgorod is located on the great trade route where the metals and other wares of the north meet the products of the south, fish from the Caspian Sea, and tea, cotton, silk, and other products from Persia, China and Japan. This fair brings together about 200,000 people from all parts of the continent, and almost everything in the line of merchandise is offered for sale. Before the revolution of 1917 the total value of the transactions reached about \$100,000,000.

**Commerce** Most of the foreign trade is with Great Britain and Germany. The exports are cereals, furs, platinum, and petroleum, and the imports are raw textiles, coal, and manufactures. In her trade with the United States, Russia sells us wools, skins, and furs and buys of us raw cotton and agricultural machinery. Our trade with European Russia amounts to about \$51,000,000 annually, about half of which is exports. Russia's trade with the United States is small, but there is greater opportunity for the extension of American trade within this country than with almost any other. Russia needs our manufactures. The completion of the Trans-Siberian Railway, connecting at Vladivostock and Port Arthur with American lines of Pacific steamers, makes transportation convenient and comparatively cheap, and the vast resources of Russia, second only to those of the United States and China, afford the basis of an extensive commerce.

### QUESTIONS

How does Russia compare, in area and population, with the United States?

What caused railroad construction to be so long delayed in Russia? What led to the construction of the Trans-Siberian Railway?

What has made Nijni-Novgorod an important commercial center? Name and locate the other important commercial centers of Russia.

Why is Russia's trade with Great Britain and Germany larger than that with the United States?





# ASIA

SCALE OF MILES

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## CHAPTER XIV

### INDIA, CEYLON AND THE STRAITS SETTLEMENTS

**INDIA** British India includes the peninsula between the Arabian Sea and the Bay of Bengal, and the province of Burmah extending to the east and north. Its total area is over one-half, and its population about three and one-half times that of the United States. It is the most densely populated possession of the British Empire. India is separated from the countries at the north by the great barrier of the Himalaya and the Hindu-Kush mountains. Through these extend the Khiabar and Bolan passes, affording communication with the interior. Its communication with other countries is almost entirely by sea. The mountains and the foot-hills slope down to the valley of the Ganges and Brahmapootra on the east, and to that of the Indus on the west side of the country. South of these valleys lies the Plateau of Deccan, forming the greater part of the peninsula.

In latitude, the country corresponds with that part of America extending from New York City to the mouth of the Orinoco River. The climate is tropical, but the high altitude of the northern provinces gives them a much lower mean annual temperature than the other portions of the country. The rainfall is abundant, but very unevenly distributed. Some districts among the Himalayas have the heaviest rainfall in the world, and in occasional localities more rain falls in a day than in the best watered portions of the United States in a year. On account of the monsoons, the country is subject to a wet and a dry season, and in many sections irrigation is necessary to the successful growing of crops.

**Agriculture** India is pre-eminently an agricultural country, and more than two-thirds of the inhabitants are engaged in tilling the soil. The land is divided into small holdings, and the most primitive methods are in vogue, consequently the people receive poor returns for the labor expended. Rice, wheat, sugar cane, millet and maize are the principal food products. Jute, cotton, opium, tea and oil-seeds are grown for export. The tea is of excellent quality, and has now nearly dis-



THE WATER FRONT, BOMBAY

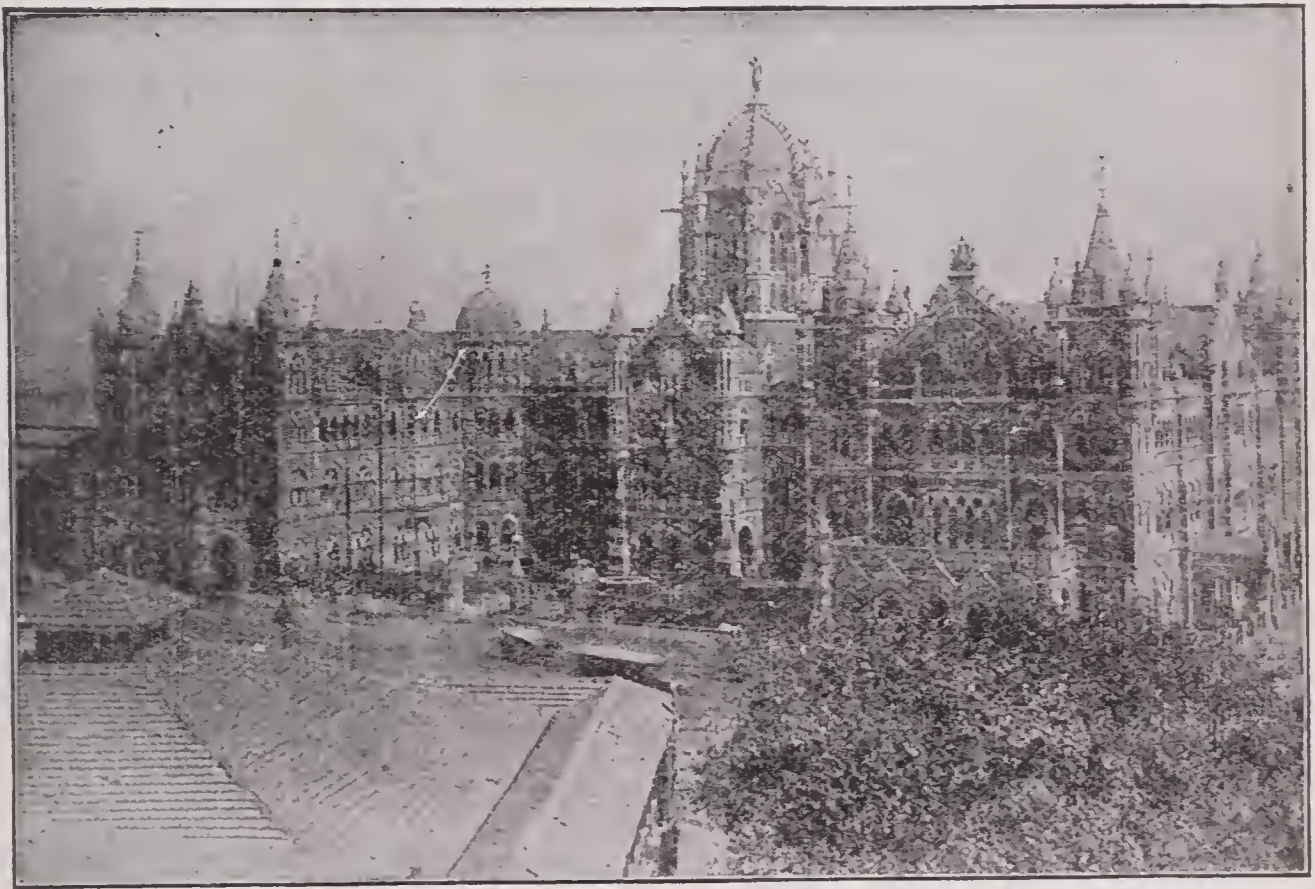
placed that of China and Japan in English markets. Silk is grown to some extent, and its culture is rapidly increasing. The coffee crop is also one of prime importance.

**Manufactures** Nearly all of the manufactures are in the nature of hand crafts. The Hindoos are remarkably skilful in the weaving of fine cotton fabrics, rugs, carpets and shawls, and in the carving of wood and ivory. The products of their handiwork are sought by the wealthy of all lands, and some articles, like the Cashmere shawls, command fabulous



prices. Recently the English factory system has been introduced, and now constitutes an important feature of the cotton industry on the west coast, and of the jute manufacture in and around Calcutta.

**Transportation** The Ganges is navigable for about a thousand miles, the Brahmapootra is the important waterway for small vessels, and the Irrawaddy is navigable for seven hundred miles. There are upwards of 25,000 miles of



STATION OF THE GREAT BENGAL RAILWAY, BENGAL

railway connecting all the important towns of the interior with each other and with the nearest seaports. These facilities enable the provinces in the interior to dispose of their products at the coast at a reasonable profit. Mail and telegraph facilities are also adequate to the needs of the country. All these conditions are largely due to the administration of the British Government, which has taken great interest in the development of public works.

**Cities**

Calcutta, the capital, near the mouth of the Ganges, with over 1,000,000 inhabitants, is the largest city and the leading commercial and financial center. Bombay, on the west coast, is the leading port for commerce passing through the Suez Canal. Madras, on the eastern coast, has an important trade in cotton and hides. Mandalay and Rangoon are the most important commercial centers of Burma.

**Commerce**

The foreign commerce of India amounts to about \$1,270,000,000 a year, which, considering its population, is small. This condition is largely due to the abject poverty of a large number of the people. The exports are cotton, wheat, rice, opium, timber and manufactured goods, consisting of textiles, rugs, carpets, shawls and carved wood and ivory. About seventy per cent of the trade is with Great Britain. China and Germany have the next largest shares. India imports kerosene from this country, and furnishes us with indigo, some textiles and opium.

**THE STRAITS****SETTLEMENTS**

These comprise several British colonies on and around the Straits of Malacca. The most important are Singapore, Penang and Malacca. The cities in the Straits have a large transport trade, that of Singapore amounting to about \$400,000,000 a year. The largest tin mines in the world are near this port, and most of their product is exported to the United States. Other important exports are rubber, gutta percha, spices, tapioca and rattan. The imports are cotton cloth, rice and opium.

**QUESTIONS.**

In what lines of manufacture are the Hindoos especially skilful? To what countries are most of their manufactured products sent?

How do the buildings in the cities of India compare with those in the large cities of Europe and the United States?

What commercial and industrial benefits has Great Britain conferred upon India?



## CHAPTER XV

### CHINA

#### POSITION AND EXTENT

China includes China proper, Manchuria, Mongolia, Eastern Turkestan, and Thibet. It is the largest country of Asia. Its area is 4,000,000 square miles, or one and one-third times that of the United States, and its population is about 400,000,000. China proper has about one-half of the area of the United States, and a population of about 245,220,000, being more densely populated than any other country in the world. Texas, if all of the inhabitants of the United States were crowded within her boundaries, would not contain as many people to the square mile. In latitude, surface and climate, China closely resembles the United States, but the influence of the monsoons makes it possible to raise crops suited to both the temperate and tropical regions.

#### Agriculture

Agriculture is the great industry of China and most of the inhabitants are engaged in it. Every foot of tillable soil is in a high state of cultivation. The land is divided into small tracts, of a few acres each, and the country has the appearance of a vast garden. All work is performed by hand labor and the most primitive methods and implements are employed, yet abundant crops are raised. In many localities irrigation is practised, the water being raised by means of wheels turned by hand or by animal power. The first wheel raises the water to a tank from which it is lifted to the second by another wheel; and so on until the highest level is reached. From here the water is distributed down the slope. Rice is grown on the lowlands of the coast, and wheat, peas, and millet wherever they can be cultivated.

Rice is the most important food crop, and China contributes one-half of the world's supply. Silk is also extensively raised and cotton is quite generally raised in the southern part of the country along the low coast of the Yangtse. There are no large fields as in the United States, but each garden contains a few plants, and these, in the aggregate, constitute a considerable supply, all of which is consumed at home.



PACKING BRICK TEA

### Mineral Resources

The mineral resources are extensive and valuable, but they have not been developed. Bituminous and anthracite coal of excellent quality are found in all the provinces. The coal fields of the country are larger than those of Europe combined, and some authorities think they are the most extensive in the world. These great deposits of coal assure the development of extensive manufacturing industries when conditions for such enterprises are ripe. The country also contains large deposits of iron ore, some of which are near the coal. Foreign



capital is seeking to develop these resources, and before the World War, Germany, Great Britain, and Japan had made a successful beginning, Germany was dispossessed of her Chinese concessions, and at the Convention on Limitation of Armaments in 1921 Japan agreed to retire from Chinese territory. Besides coal, copper, tin, lead and silver are found, and mined to some extent. The abundance of porcelain clay of the finest quality has made China one of the leading countries in the manufacture of porcelain ware.

### **Manufactures**

Most of the manufactures are home industries, and are carried on exclusively by hand labor. The silk and cotton fabrics are nearly all made in this way, but recently a few factories, under foreign management, have been established. These are for reeling silk and spinning cotton. China silks are noted for their fine texture and delicate finish. Porcelain, or china-ware, is also an important manufacture, and in many homes reha, the fiber of Chinese grass, is woven into light fabrics for summer wear.

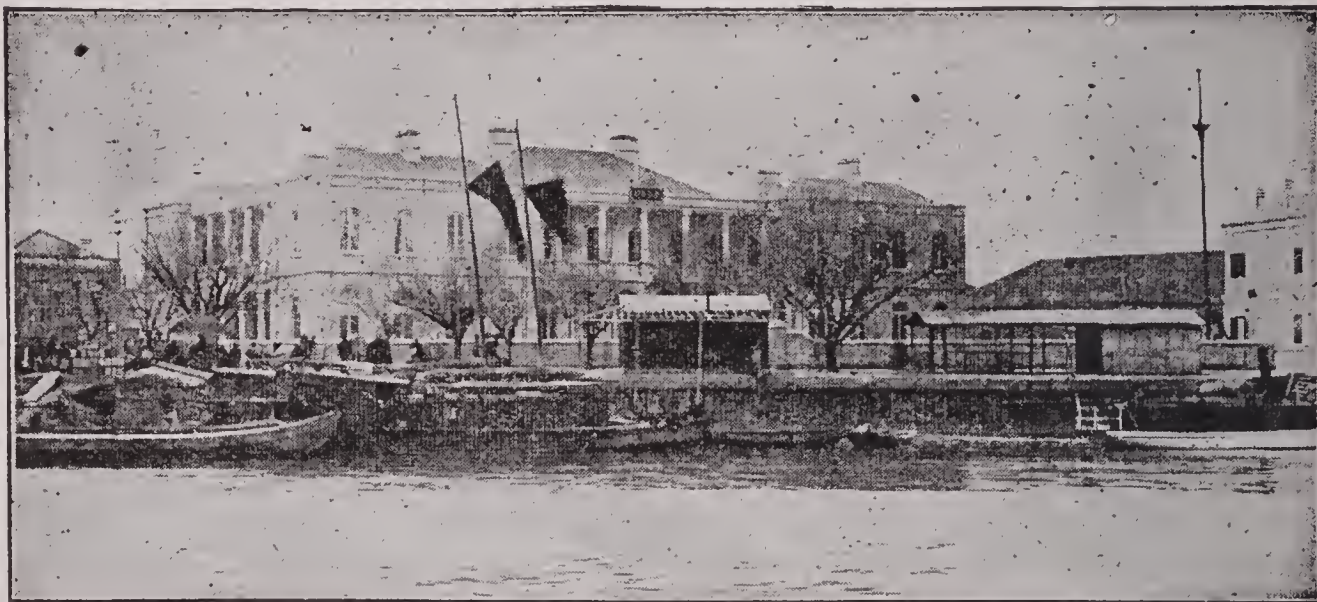
Since the importation of firearms was prohibited by the Allied Powers in 1898, a number of manufactories have been established for the purpose of supplying these to the army. All of these factories are government concessions, and are under the supervision of European mechanics.

### **Transportation**

The large rivers constitute the important waterways into the interior. The Yangtse is navigable for over a thousand miles, the Hoangho is obstructed by bars, but is navigable for small craft, and the Sikiang on the south furnishes the outlet for the country tributary to Canton and Hongkong. Canals are numerous, but when compared with those of Europe or the United States are poor. The Grand Canal extends from Hangchow to Tientsin, a distance of 700 miles, and is still in a usable condition throughout most of its length, though it was constructed more than a thousand years ago. Roads are so poor that transportation through the interior is well nigh impos-

sible, and there are over 7000 miles of railway in the entire country. The most important line—a branch of the Trans-Siberia Railway—extends to Port Arthur. The innovations consequent upon the introduction of railways make their construction a slow process.

**Cities** Pekin, the capital, is significant only as a political center. Since the Boxer outbreak in 1898, the representatives of foreign governments have been granted special privileges for protecting the quarter in which they reside, and have built a city,



CUSTOM HOUSE, TIENTSIN

resembling in structure and plan, those found in Europe and America. Tientsin is the seaport of Pekin, and has a large trade. Shanghai is the most important center of trade with the United States and Japan, and Canton, the largest city of the Empire, has in connection with Hongkong, a large trade with Great Britain. The inland cities are of but little commercial importance.

**Commerce** The trade of the inland provinces is small. The region is sparsely settled, the inhabitants are poor, and the difficulty of transportation prevents extensive exportation or importation of merchandise. Skins, wool and musk are ob-



tained from Thibet. Mongolia is good grazing region, and supplies the camels required in caravan trade with Russia. Manchuria is a good grazing and farming district, and exports millet and animal products to China proper.

The great bulk of foreign commerce is carried on by China through open, or treaty, ports, of which Tientsin, Shanghai and Canton are the most important. The exports are tea, raw silk, porcelain, silk goods and such hand work as lacquer ware and carved wood and ivory, in which the Chinese are remarkably skilful. The leading imports are cotton goods, opium, rice, wheat flour, kerosene, silk, metals and machinery. Nearly one-fifth of the tea goes to the United States and about one-eleventh goes to Great Britain. Nearly half of the foreign trade is through Hongkong, and the largest share is with Great Britain. Most all of this is in the hands of European agents residing in Hongkong or Canton.

A large carrying trade is maintained with Russia, and, previous to the construction of the Trans-Siberian Railway, caravans made overland trips as far as Morocco. The principal article of this trade is tea which is pressed into bricks for convenience in transportation, and also to meet the tastes of the Russians, who have been accustomed to obtaining it in this form for many years.

The trade with the United States is steadily increasing. China imports from us kerosene, wheat flour, machinery and hardware, and exports to us tea, silk and wares peculiar to their manufacture. The American trade nearly all goes through the Pacific ports, Seattle and San Francisco, and lines of steamers are maintained between these cities and the Chinese ports.

### **The People**

The Chinese belong to the yellow race. They are conservative, industrious and frugal. They work long hours and for low wages, and while some acquire means and a few become wealthy, the great mass of the people are in abject

poverty. Aside from the inherited right to the throne, any office in the Empire is open to the humblest citizen, if by ability in the execution of public trusts he can show himself worthy of it. Promotion in the Government service is by examination, and only the ablest scholars succeed in securing positions.

The Chinese are the representatives of the oldest existing civilization. When the nations of the West were in a state of barbarism, these people were probably as far advanced as they are today, and for more than 2000 years they were considered the only civilized people of the Far East. They afford the only illustration of people who, for such a length of time, have neither advanced or gone backward. This remarkable characteristic is largely due to the element of ancestor worship in their religious belief. They adhere closely to the institutions and customs of their forefathers, and are not willing to introduce changes which will do away with, or modify, this ancient usage. Consequently they are slow to adopt the customs of western civilization.

**HONGKONG** This is a small island at the mouth of the Siking near Canton, and has an area of about thirty-nine square miles. It is a British colony and is the most important commercial port of Asia. It is an important port of call, and has an extensive transient trade, as it is frequented by the ships of all nations. The commerce is in the hands of Englishmen, and Chinese who have become British subjects.

### QUESTIONS.

Compare the Chinese Empire with the United States in area, climate, products and population.

Considering the Chinese to be the oldest existing civilized nation, account for the backward state of the country, and the lack of progress.

How do means of transportation in China compare with those in other civilized countries?

What is the present prospect for commerce between the United States and China? What reasons have you for your opinion?

Compare China with the United States in area, climate, products and population.



## CHAPTER XVI

### JAPAN

#### **POSITION AND EXTENT**

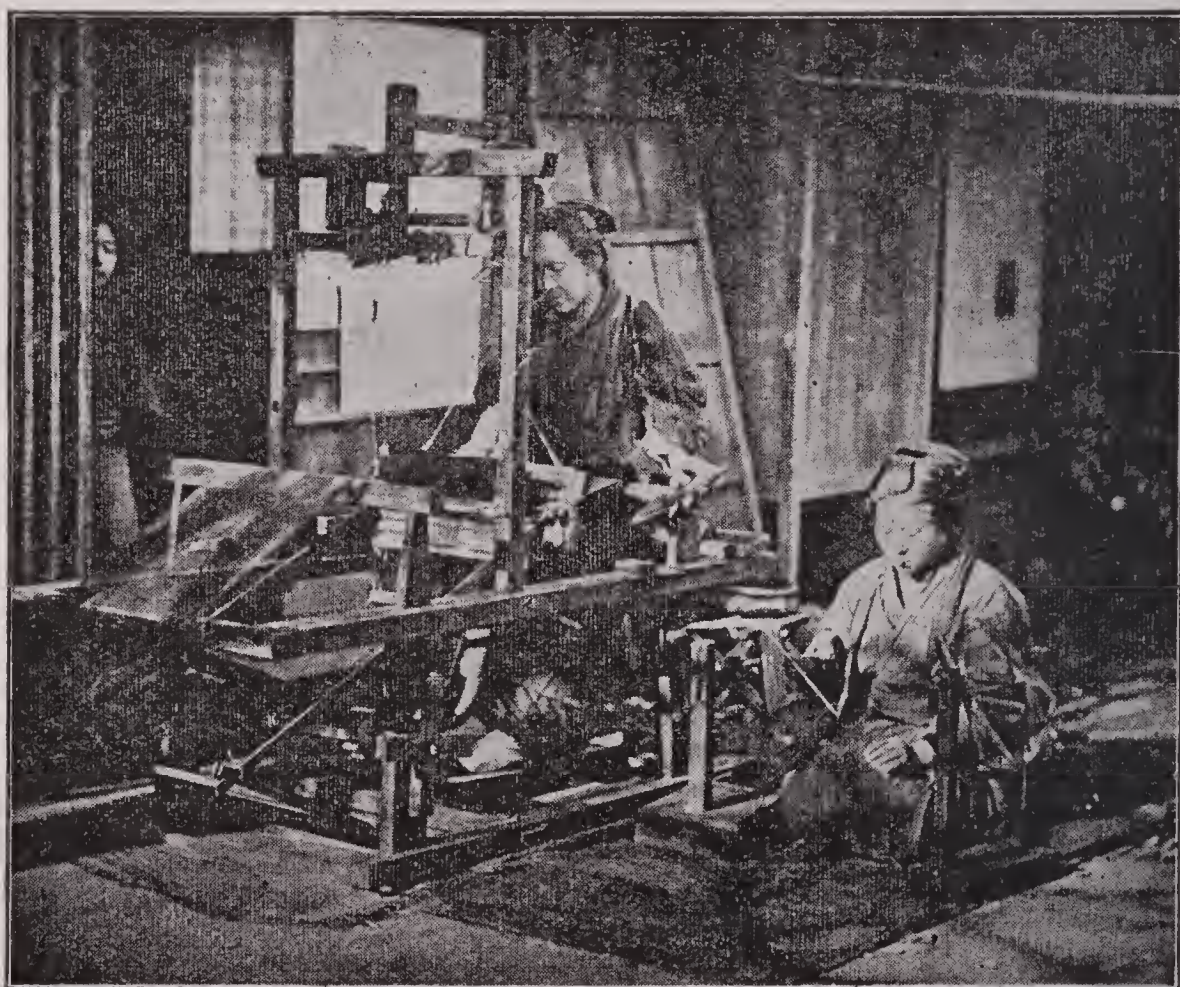
The empire of Japan extends along the coast, from the twenty-second to the fifty-first parallel of north latitude. The greater part of the empire comprises the islands of Formosa, Kiusiu, Hondo, Shikoku, Yezo, the southern part of Sakalhalin and Korea. Formosa was obtained from China in the war of 1894 and 1895. Hondo is the largest and exceeds all the other islands in area. In all, there are 487 islands worthy of notice. The area of Japan exceeds 260,700 square miles. It is a little less than the combined areas of California and Colorado. In 1920 the population was over 77,284,000, more than half that of the United States.

The surface is mountainous, and Hondo is characterized by a main mountain range, extending the length of the island, and having upon either side lower parallel ranges. The Rainfall is abundant, and the continual weathering of the rocks has covered the valleys with a deep and fertile soil. The climate in the extreme south is sub-tropical and temperate in the other portion of the empire.

#### **Agriculture**

The large population makes it necessary to bring the soil to the highest state of cultivation, and also to occupy every square foot of tillable land, which, owing to the mountains, does not exceed one-sixth of the area of the empire. Fish refuse is used for fertilizer and abundant crops are raised. Rice is the leading food crop, and is grown along the coast and in the lowlands of the west. The other important food crops in order are wheat, rye, barley, and beans. Tea is raised in the southern islands, and the lacquer tree, from the sap of which

the lacquer varnish is obtained, is extensively cultivated. The mulberry tree is cultivated throughout Hondo, except in the extreme northern part, and silk-raising is one of the most important industries. Formosa is the leading camphor-producing country and more than half of the world's supply comes from this island.



WOMEN SPINNING AND WEAVING SILK

### Mineral Resources

Coal, iron and copper are the most important minerals. The out-put of coal and iron is steadily increasing and coal markets have been established in China, the Straits Settlements and the Philippines. The most important mines are in Yezo and Kiushiu. An excellent quality of copper is also found, and its mining has developed into quite an important industry.



**Manufactures** Textiles constitute the leading manufactures, and give employment to over 1,000,000 operatives. Seventy thousand of these are engaged in the cotton mills, of which there are now over seventy in operation. Large quantities of silk are also made. The raw material is exported from India, and only coarser goods are made. Much of both the cotton and the silk, however, is woven in hand looms in the homes. The



THE HARBOR, NAGASAKI

best straw-matting in the world is made both for home consumption and for export. Woolens are also manufactured to some extent.

The Japanese are skilful in the manufacture of art goods, and in making wood, metal, pottery and small wares, but these are all home industries and are of minor importance in the commercial development of the country. Since the admission of foreigners to the country, the Japanese have made remarkable advancement in

the adaptation of the methods and machinery of western nations. Their manufacturing industries are rapidly developing, and they now constitute an important factor in the commercial and industrial life of the Empire.

**Transportation** The carriage roads are in rather poor condition for the transportation of merchandise, though the light jinrikishas, which are two-wheeled carts drawn by men, traverse them without difficulty. Most of the cities and productive valleys are within easy reach of the sea, where good harbors are numerous. There are about 4000 miles of railway in the Empire, connecting the most important towns. Telegraph, telephone and mail services are also good.

**Cities** Tokio, the capital and largest city, has over a million inhabitants, and is an important commercial port. Yokohama and Kobe are centers of the largest foreign trade. Nagasaki has a fine harbor and is an important coal market, and Hakodate on Yezo is the commercial center for the north, and has a flourishing trade in coal and fish. These and a number of small cities are treaty ports and are open to the vessels of all nations.

**Commerce** Japan has an important trade with foreign nations and it is constantly increasing. The leading imports are raw cotton, iron and steel, wool, flax, hemp, jute, jute textiles, sugar, petroleum, machinery and firearms. The leading exports are silk, raw and manufactured, cotton yarn, tea, coal



RIVER FRONT, TOKIO



and copper. Rice, porcelain, straw goods, matting and small wares are also exported. Great Britain furnishes the largest part of the imports, with the United States standing second, British India third, Germany fourth, and China fifth. The United States takes most of the exports, of which tea constitutes the largest share. Most of the merchandise enters the country by San Fran-



A VIEW IN YOKOHAMA

cisco and Seattle. The yearly foreign trade amounts to about \$590,000,000, about three-fifths of which is with the United States. The yearly exports to this country amount to about \$204,000,000, and the imports from it \$102,500,000.

**The People** The Japanese, as do the Chinese, belong to the Mongolian or yellow race, but in nearly all respects they are the opposites of the Chinese. They are small of stature, wide awake, and aggressive. They are quick to see advantages

derived from the adoption of the customs and methods of western nations, and in the last few decades have made wonderful progress in government, education, industries and commerce. For this reason they have been styled "the Yankees of the East," and Japan is also called the "Asiatic Great Britain." There is a constantly increasing demand for American products in their country, and this demand the American merchants and manufacturers are striving to supply.

**KOREA** Previous to the Chinese-Japanese War in 1895, Korea was a dependency of China, but at that time it became independent. It is often referred to as "the Hermit Kingdom," and from an industrial and commercial point of view it is of little importance. Its area is about equal to that of Minnesota, and its population is about 10,000,000. It is an important strategic point and the attempt of Russia to secure a foothold in the country, together with her refusal to evacuate Manchuria, according to agreement, led to the Russo-Japanese War in 1904-05. As a result of that conflict Korea has become a Japanese dependency. The country is without any important cities. Seoul is the capital, and Mushampo and Fusan are the most important seaports.

### QUESTIONS.

Why is intensive farming so generally practised in Japan?

How do the mineral resources of Japan compare with those of China in extent and value? In regard to their development?

Account for the rapid progress that Japan has made since 1850.

In what respects do the Japanese differ from the Chinese?

Why does the United States have so large a proportion of Japan's foreign trade?



## CHAPTER XVII

### OTHER ASIATIC COUNTRIES

#### **SIAM AND THE FRENCH POSSESSIONS**

These occupy part of the Indo-China Peninsula. Siam is an independent kingdom, and the French colonies include Tongking, Annam, Cambodia and Lower Cochin-China. The most important industry of the whole region is raising rice. In the deltas of the Mekong, more than half a million tons are grown yearly. This is exported to Hongkong and Singapore. Pepper, other spices, tropical fruits and teak timber are the other important exports. The imports are manufactures, especially textiles and machinery.

#### **AFGHANISTAN AND BALUCHISTAN**

These are two quasi-independent states, west of British India, and lying between Turkestan and the sea. Afghanistan contains some of the richest mineral deposits on the continent. Both countries are separated from India by mountain ranges which can be traversed only through passes. The climate is cool-temperate, and the leading products are cereals and peas and beans. Most of the inhabitants are wandering tribes, and there are no settled industries. These countries are important on account of their position, and have for years formed a "bone of contention" between Russia and Great Britain. The mountains are crossed through two important passes, the Khaibar, connecting Peshawur in India with Jalalabad and Kabul, and now traversed by a railroad. The Bolan Pass also contains a branch of the same line of railway extending as far as Kandahar. Considerable trade passes over these routes. Both countries are under the protectorate of Great Britain.

**PERSIA**

Persia occupies the greater part of the Plateau of Iran. About one-third of the country is desert, but the valleys and lowlands receive enough moisture from the rains and the mountain streams to be productive and abundant crops of food-stuffs are raised. The country is also quite rich in minerals, and in past ages mines of tin, copper, lead and silver were worked with profit. Tobacco, small fruits, opium, wool and silk are the most important products for export. The Persians are noted for their skill in weaving rugs and carpets, which are sold in American and European markets at fabulous prices. There are also valuable pearl fisheries in the Persian Gulf. Generally the industries are unimportant as the country is in a backward condition. Tabriz is the center of the manufacture of rugs and shawls. Bushire and Bender-Abbas are the seaports and Trabizond is the center of Russian trade.

**THE EAST INDIES**

The East Indies include nearly all the islands of the Malay Peninsula. Most of them are Dutch Colonies and they have an excellent administration. The most important islands are Java, Borneo, Sumatra and New Guinea. North Borneo belongs to the British Empire, West New Guinea is Dutch and the eastern half is divided between the British and the Germans. All of these islands produce tropical fruits and spices. Java and Sumatra lead in the production of coffee, sugar-cane, tobacco, rice, indigo and pepper. The coffee of this region is celebrated in both Europe and America. The trade of the islands is in the hands of middlemen, most of whom are Chinese.

**QUESTIONS.**

Of what commercial advantage are her Asiatic colonies to France?

Of what value are the Dutch East Indies to Netherlands?

Why is Great Britain especially interested in Afghanistan?

With what countries does Persia have the most extensive trade?



## CHAPTER XVIII

### AUSTRALIA AND NEW ZEALAND

#### POSITION AND EXTENT

Australia extends from the eleventh to the fortieth parallel of south latitude and from the one hundred thirteenth to the one hundred fifty-fourth degree of west longitude. Its greatest length from east to west is 2360 miles, and from north to south 1600 miles. Its area is a little less than that of the United States, exclusive of Alaska, and the population in 1921 was 5,436,794.

Australia is the highest portion of a partially submerged plateau, which, at an average depth of six hundred feet, extends around the continent for a considerable distance. The mountains are near the coast and from them the land slopes gradually to the great interior plain that constitutes the larger part of the continent. In the center of this plain there are some low ranges of hills, but with this exception it is nearly level, and in the south it extends to the coast. The highest mountains are in the eastern part of the continent. In general appearance these mountains resemble the Appalachians, being the worn down remains of an ancient system. Some one has compared the continent to a huge plate, high around the edges and gradually sloping to the great flat interior. The comparison is a happy one.

The streams flowing eastward into the Pacific are short and rapid, but those flowing south and west are longer and flow more quietly. Most of these lose themselves in the salt lakes and marshes of the interior. The Murray-Darling system, flowing into the sea on the south, is navigable for some distance. The rivers on the west are short and small.

**Climate**

The large body of water surrounding the continent exerts an equalizing influence over the temperature, yet the summers are extremely hot, owing to the vast expanse of land from east to west upon which the sun's rays fall vertically several hours in the day. During the winter the interior becomes quite cold, and the land winds are several degrees below the surrounding atmosphere over the sea. Frost seldom occurs between the coast and the mountains.

**Rainfall**

The continent lies within the belt of the southeast trades, and the eastern coast secures an abundance of rain. On the inner slope of these mountains there is a narrow strip of country having an annual rainfall of about twenty inches. From this semi-arid belt the rain gradually diminishes until the great interior desert is reached. This great region is from five to seven degrees wide and occupies about one-half the continent. Its greatest elongation is from east to west, and it extends northward from the Great Australian Bight to the twentieth parallel. The southern coast east of the Bight and a small area in the extreme southwest are well watered, and the most northerly section east of the Gulf of Carpentaria has a heavy rainfall. The rainfall is very unevenly distributed, and at irregular intervals, sometimes extending over a period of several years—large areas suffer from disastrous droughts.

**Resources**

Australia is so far removed from the other continents that its animal and vegetable life are unlike those of any other part of the world. Many of the plants bear close resemblance to those of past geologic ages, such as those of the coal period. Where the rainfall is abundant heavy forests are found. Some of the gum trees approach the Big Trees of California in size, growing to a height of nearly 400 feet. Mingled with these are smaller trees, tree ferns, and club mosses of gigantic size. Most of the foliage has a leathery structure; the



leaves of some plants turn their edges instead of their surface towards the sun and earth. In the semi-arid and arid regions varieties of rapid growing grasses are found.

**Agriculture** The grasses form excellent fodder for sheep, and the climate of the semi-arid regions is well suited to the requirements of these animals; therefore, we find sheep-raising the most important agricultural industry in all the provinces. Most of the flocks are merinos, and Australia has become the largest wool-producing country of the world. The wool is of excellent quality and is exported to all the leading countries engaged in the manufacture of woollen goods. The annual output exceeds 500,000,000 pounds or nearly one-third the world's supply.

Hides, tallow, and fresh meat are also important animal products for export. The meat is frozen and transported in refrigerator ships, reaching England in an excellent state of preservation.

Grapes for raisins are raised in Victoria and New South Wales. Sugar cane is raised in Queensland and cereals for home use are grown in all the provinces. The forests supply a good quality of hard-wood lumber for export, and some gums and important drugs.

**Minerals** Gold is the most important mineral and, next to wool, constitutes the most valuable export. Before the discovery of the metal in South Africa, the Australian gold mines were the richest known. The most important mines are in Victoria. Copper, silver, and iron ore are also found, but the iron has not been worked to any extent. Coal is found in New South Wales and New Zealand and is exported to quite an extent. Australian coal was formerly in general use in the southern part of California, but the discovery of petroleum in that locality has largely done away with the necessity for coal.

**Cities** Sydney, the capital of New South Wales, is the largest city of Australia and has about 725,000 inhabitants. Melbourne, the capital of Victoria, has a population of over 650,000. It carries on

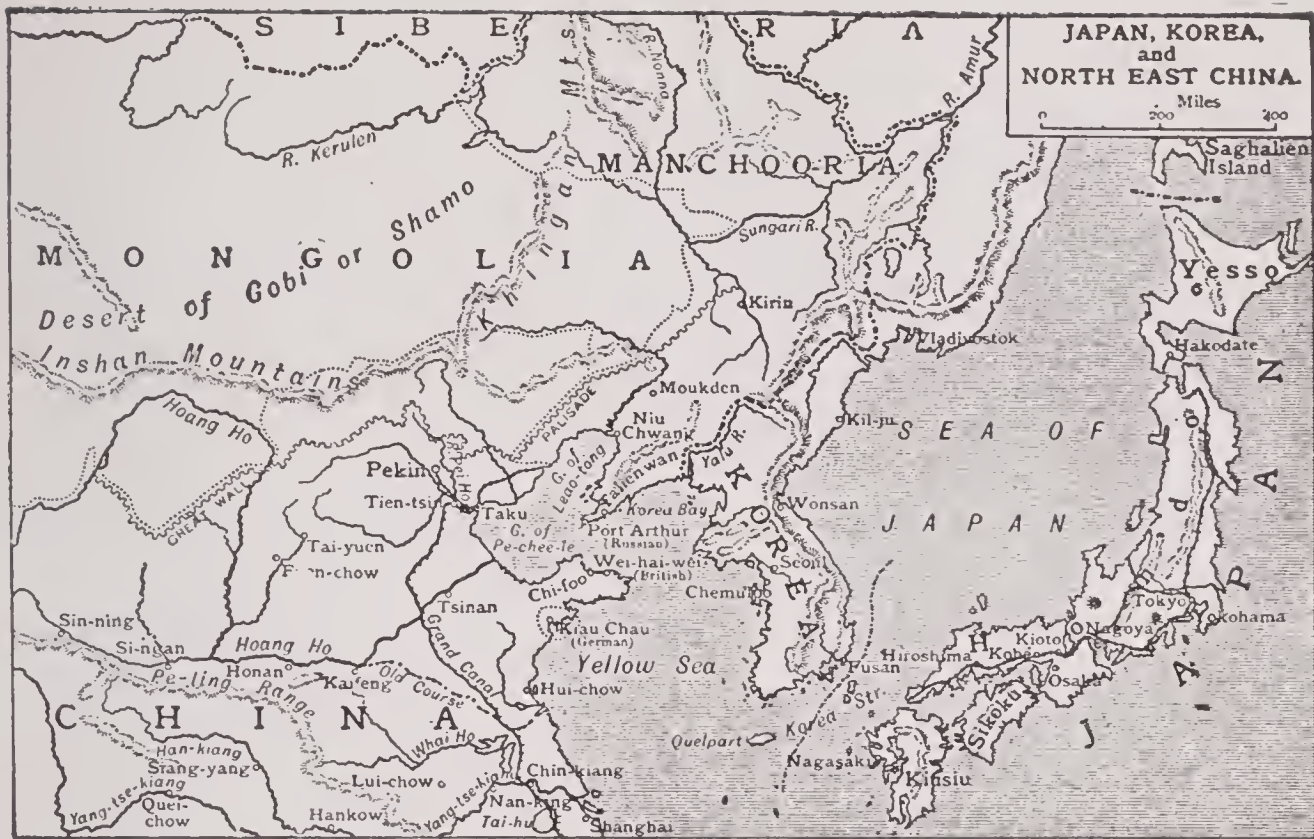
extensive foreign trade. Adelaide, in South Australia, Sidney, in New South Wales, and Brisbane, in Queensland, are the other important cities in the eastern portion of the continent. Hobart is the leading city of Tasmania, and Perth is the most important town on the western coast.

All the eastern provinces and South Australia are well supplied with railways. They connect all the important towns on the coast and a number of lines extend inland from 300 to 500 miles. Telegraph lines are also found in these provinces, and a line extends over the continent from Adelaide to Palmerston on the northern coast.

**Commerce** Australia is one of the most valuable colonies of Great Britain and the leading trade is with that country, which has about three-fourths of the foreign commerce. The United States is second in importance. The exports are gold, wool and mutton. The imports are manufactured goods, hardware and machinery. The entire foreign trade amounts to about \$650,000,000 a year, of which a little over \$300,000,000 are exports. The annual trade with the United States is about \$75,000,000. Our exports to Australia consist of tobacco, lumber, leather, railway-supplies and coal-oil. Our principal import from there is wool.

**NEW ZEALAND** The Dominion of New Zealand consists of thirteen groups of islands including the Mandatory of the Samoan Islands. The total area is 104,910 square miles, and the population in 1921 was 1,070,910. The Dominion of New Zealand is about 1200 miles southeast of Australia. North Island (44,130 sq. mi.), South Island (58,120 sq. mi.), and Stewart Island (66 sq. mi.) having a length from north to south of 1100 miles, comprise the greater part of the Dominion. A large portion of the surface is mountainous. The climate varies considerably in the different divisions, owing to the extent north and south. In general, it is mild with abundance of rain.





The country is pastoral rather than agricultural. The chief exports are wool, frozen meat, butter and cheese, hides and pelts, and gold. The imports include clothing, boots and shoes, coal, sacks, textiles, tobacco and other manufactured products. The foreign trade in 1920 amounted to £108,037,774, of which £18,556,300 was with the United States.

### QUESTIONS

What portions of Australia are suited to agricultural purposes? What portions have valuable mineral deposits?

What has made Australia the leading wool-producing country? In what other industries does she excel?

By what people was Australia settled? How do they compare in habits and customs with the people of the United States?

What American ports are engaged in trade with Australia? Is this trade increasing?

What effect has the completion of the Panama Canal had upon our trade with Australia?



## CHAPTER XIX

### AFRICA.

**Surface** Africa extends from the thirty-seventh parallel of north latitude to the thirty-second parallel of south latitude, and is about one and one-third times as large as North America. The continent is broadest in the northern part, and it has a remarkably even coastline with few good harbors. The mountains are different from those of any other continent. In the interior is a vast plateau, with a rim of low mountains around the edge, near the coast. The Atlas Range on the north reaches an altitude of 14,000 feet, and the loftiest peaks are in the eastern and central parts of the continent, among the Ruwenzori and the Mountains of the Moon. The rivers all rise in the interior and have falls or rapids wherever they pass over the Fall line to the low land of the coast regions. For this reason they are not navigable for ocean going vessels, except for a few miles from the sea. This rim of highlands around the continent prevented the interior from being explored for many years after America was discovered and settled.

**Climate** The extreme northern and southern portions of the continent have a warm temperate or semi-tropical climate, but most of this vast area lies within the tropics. The highlands in the interior of the equatorial regions give that part of the continent an abundance of rain, and the forests and other vegetation rival in luxuriance that of the Amazon valley. With a few exceptions, the northern and southern portions of the continent also have sufficient rainfall for agricultural purposes; but between these sections, and the equatorial regions on the other side, are the great arid regions forming the Sahara on the north and the Kalahari Desert on the south.

**Political Divisions** A political map of Africa shows that nearly the entire continent is divided among European powers. Morocco, Abyssinia and Liberia are the only independent states, and the Kongo Free State is a semi-dependency of Belgium. Of all the territory claimed by the different nations, France has the largest area, and some of the territory is valuable, but the British possessions are by far the most important, both on account of their resources and their strategic locations.

For industrial and commercial purposes Africa can be considered in three divisions: Northern Africa, which extends from the Mediterranean to the Soudan; Central Africa, from the Soudan to the Zambesi River, and Southern Africa, from the Zambesi to the Cape of Good Hope.

## NORTHERN AFRICA.

**COAST COUNTRIES** The land between the Mediterranean and the Atlas Mountains is fertile, and produces cereals, semi-tropical and tropical fruits, cotton, coffee, vegetables, cacao and spices. All the surplus of these crops is shipped to Southern Europe, where it finds ready sale. Morocco is poorly governed and all industries are in a backward condition, but Algeria and Tunis, which are French colonies, have, under the protecting care of home government, become fairly prosperous. Algeria exports large quantities of cork, and much of the so-called French wine is produced here. Besides their own exports, these countries handle a lucrative caravan trade from the region south of the Sahara. Caravans bring ostrich plumes, gums, ivory and other tropical products, which are exchanged for cotton goods and other manufactures.

The trade centers are Algiers, which is the financial center,



Oran, the most important seaport, and Tripoli, the center of the caravan trade, which receives about 10,000 camel loads of merchandise annually. Trade is principally in the hands of Arabs, who make regular trips between Tripoli and Timbuctoo and Lake Chad.

## EGYPT

Egypt is the most important country in Northern Africa. The fertile portions are confined to a few



THE SUEZ CANAL

miles each side of the Nile, from which water for irrigation is supplied. The land is so well tilled that abundant crops are grown. Wheat, millet and cotton are the most important crops, and cotton is the leading article of export. The long fiber of Egyptian cotton rivals in quality the famous "sea island" cotton of the United States, and for that reason large quantities of it are sent to this country each year for making thread. Rice is grown in large quantities, but not enough for the needs of the people. Wheat and beans are

exported to Europe. Sugar-cane is raised, and considerable raw silk is produced.

The cultivable area has recently been largely extended by the construction of two great dams across the Nile, one at Assuan, and the other at Assuit. The former is one of the finest pieces of engineering in the world, and will store sufficient water to irrigate 2500 square miles of land.

There are no mining or manufacturing industries of note, and

cigarettes made from Turkish tobacco are the most important manufactured export. The leading trade is with Great Britain. The exports are agricultural products, and the imports manufactures, coal and lumber. Cairo is the largest city, and is at the head of the Nile Delta. Alexandria is the seaport through which the exports and imports pass. Port Said and Suez are at the opposite ends



PORT SAID, THE NORTHERN ENTRANCE TO THE SUEZ CANAL

of the Suez Canal. Khartum is the most important commercial center in the interior. A railway 1200 miles in length extends from Cairo to Khartum, and short branches have been constructed at frequent intervals to act as feeders of this line. About 4000 ships pass through the Suez Canal each year, and seven out of every ten of these are British.

Egypt formerly was a colony of Great Britain, which managed



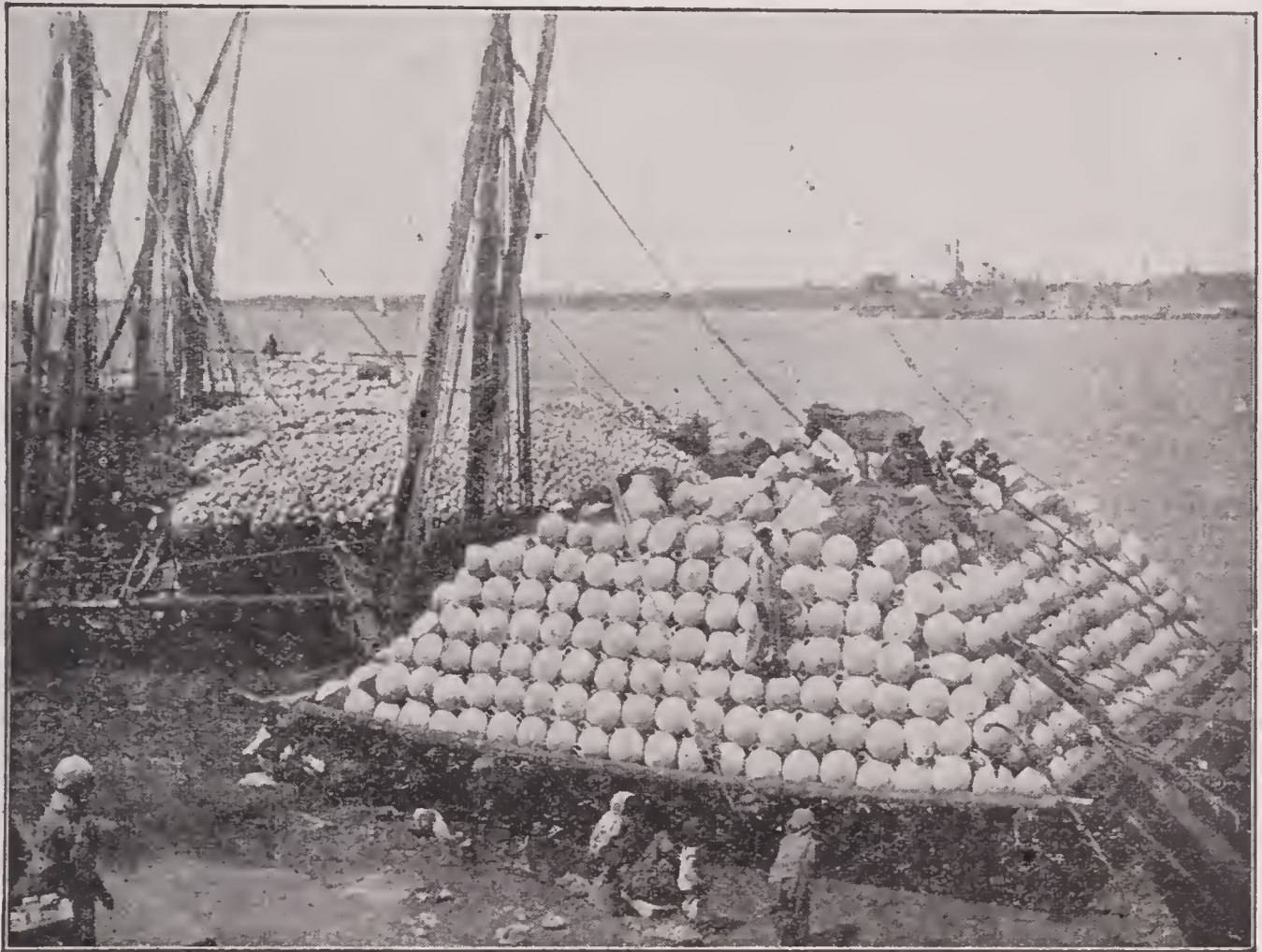






all of its financial and commercial affairs and supervised its foreign relations, as well as the Suez Canal.

**SOUDAN** As the mountainous regions in the north merge into the desert, so does the desert merge into the grassy plains of the Soudan. Commercially, this region is of but little



A CARGO OF EARTHEN JARS, EGYPT

importance. With the exception of Liberia on the western coast, the territory is divided between Great Britain and France, and in time portions of it will undoubtedly be developed, but the climate along the western coast is so unhealthful that white men can not live there. Most of the trade is from the interior and finds an outlet through the northern French colonies by means of caravans.

## CENTRAL AFRICA.

This includes a region considerably larger than the United States. It has a tropical climate, abundant rainfall and, over much of its area, a luxuriant tropical vegetation. It has over 1,000,000 square miles of dense forests, rivalling in the extent and value of their products those of the Amazon, and it is destined to become one of the great sources of the world's timber supply.



SCENE ON AN OSTRICH FARM

As in the Soudan, the lowlands along the coast are unhealthful to white men, but in the interior the climate is more favorable and the development of the Kongo region shows that Europeans can live in the country with perfect safety.

**BELGIAN  
CONGO**

This country occupies a large portion of the basin of the Kongo River and includes 900,000 square miles, and a population of 5,000,000 to 7,000,000. The Kongo and its tributaries provide over 6000 miles of navigable waterways,



which enable the most important commercial sections to be reached by steamers. A railroad from Banana to Leopoldville, 249 miles, provides transportation around the falls in the river. Another from Kabalo to Albertville on Lake Tanganyika connects the west coast of Africa with Belgian East Africa and the east coast. The Katanga Railway was completed to Bukama in 1918, forming connection with the Cape-to-Cairo system.

Since the World War, the country has been administered as a Colony of Belgium and rapid progress is being made in the development of its resources. Large copper mines have been developed in the southeastern part of the colony and mining is now the chief industry. Most of the work is in charge of American engineers. The export of rubber has decreased because of the destruction of most of the rubber trees. The region is well adapted to agriculture, which will probably receive attention at an early day.

### **FRENCH CONGO**

French Congo extends to the northeast from the Atlantic Coast and is bounded on the south by the Congo River, and on the north by the colony of Kamaroon. Its climate and products are in every way similar to those of the Belgian Congo.

### **BRITISH EAST AFRICA**

This large productive area lies northeast of Belgian Congo. It includes the East Africa Protectorate, the Uganda Protectorate and the Islands of Zanzibar and Pemba. The East Africa Protectorate has an area of about 247,000 square miles and a population of nearly 3,000,000. The region is well adapted to agriculture. There is a railroad from Mombasa on the coast to Port Florence on Victoria Nyanza, 600 miles distant. This road connects Uganda with the coast.

### **KENYA AND TANGANYIKA TERRITORY**

These territories formerly comprised German East Africa. During the World War the region was conquered by the British forces, and it is now under British control. The area is about 384,000 square miles and the population is estimated 7,660,000. The

country is agricultural, and the chief exports are cotton, hides, wax, rubber and ivory.

### **PORTUGUESE POSSESSIONS**

The Portuguese possessions lie south of the Kongo Free State and British East Africa. They are the remnants of territory claimed under explorations made a little before Columbus discovered America. The country on the west coast has never yet been developed in the least, except in the vicinity of a few towns which have fairly good harbors, but the east coast has a number of good harbors, which furnish the outlet for the trade from the interior, and this section has been opened to civilization more fully than that on the west.

### **UNION OF SOUTH AFRICA**

#### **UNION OF SOUTH AFRICA**

This Dominion of the British Empire includes the provinces of Cape of Good Hope, Natal, Transvaal, Orange Free State and South-west Protectorate, formerly German South West Africa, and a few other small political divisions. The total area is about 474,000 square miles and the population in 1921 was 5,973,394, of which 1,542,161 were white. The interior is too dry for successful agriculture, but it constitutes an excellent grazing country and sustains thousands of cattle, sheep and goats. South of the Orange River Colony there is more rainfall, and nearly all crops common to a temperate climate are raised. Fruits are grown profusely, and as they ripen during our winter months the grapes find a ready market in London and other English cities, to which they are sent in refrigerator ships. Wool, mohair, hides and leather are other agricultural exports.

#### **Minerals**

This is one of the richest mineral regions in the world. The diamond mines in Kimberley supply ninety-eight per cent of all the diamonds used, and the gold mines of the Transvaal, near Johannesburg, are the richest mines in the world, and their development is only just begun. Coal in abun-



dance is also found in this region, but it has not yet been mined to any extent.

**Cities** Cape Town, at the southern extremity of the continent, before the construction of the Suez Canal, was one of the most important ports of call in the world and now receives several thousand vessels every year. Johannesburg, next to Cairo, is the largest city of the continent. It has been built since the opening of the great mines in the Transvaal and is in every way a modern city of some over 100,000 inhabitants. Pretoria was the former capital of the Dutch Republic. Durban, Lourenco Marquez and Beira are important seaports on the eastern coast and each has a railway connection with the interior. Port Elizabeth, on the south coast, is the most important seaport.

Zanzibar, on the island of the same name, opposite British East Africa, occupies a position in reference to this region somewhat similar to that of Hongkong in reference to Asia. It is a British colony, but its government is administered by a sultan. The great island of Madagascar belongs to the French.

**RHODESIA** Under this name is included the region extending from northwards to Belgian Congo and westward to Tanganyika Territory. It is under the administration of the British South Africa Company. For administrative purposes, it is divided into Southern Rhodesia and Northern Rhodesia. The entire area is 440,000 square miles. The country is rich in minerals and agricultural resources. The Cape-to-Cairo Railway traverses Southern Rhodesia.

**Commerce** Comparatively, the commerce of Africa is yet small. It is only within the last few years that by reason of its wonderful resources and possibilities the attention of the civilized nations has been turned to this continent. As these possibilities are becoming better known, the commerce is increasing, and the development in the near future will undoubtedly be much

more rapid than it has been in any equal period in the past. The great trunk line, known as the Cape-to-Cairo Railroad, has been projected, and about 1800 miles of the southern portion and 1200 miles of the northern portion of it have already been constructed. Both in the South and in the North branches extend from this line to the coast towns, or into the fertile agricultural or mineral regions. An immense steel bridge has been completed across the gorge below Victoria Falls on the Zambesi. This bridge is one of the most remarkable feats of engineering in the world. It conducts one branch of this railway into a country rich in both agricultural and mineral resources.

The Cape-to-Cairo telegraph is completed as far north as Lake Tanganyika, and south beyond Khartum. All important cities are also connected by telegraphic lines. Most of the trade is with the European countries, though the United States has exported to South Africa considerable quantities of railway supplies, hardware and electrical machinery. Africa has a vast population, which when once fully acquainted with the customs and usages of civilization, will create a demand for manufactures that cannot do otherwise than greatly stimulate the industries of all countries having commercial relations with the continent.

## QUESTIONS

Which is the larger, Africa or North America?

How do the climatic conditions in Africa compare with those in South America?

Why was Africa so long neglected by the civilized nations? What nations now have a controlling influence in the affairs of the continent?

With what European countries do the States of Northern Africa engage in trade? What commodities are exchanged?

How do the products of the Belgian Congo compare with those of the Amazon Basin?



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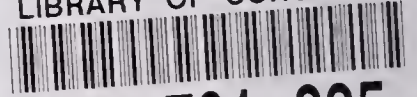








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